ENVIRONMENTAL AND BEHAVIORAL FACTORS INFLUENCING WEIGHT MANAGEMENT AMONG MEDICALLY AT RISK OBESE ADULTS

by

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The purpose of the study was to examine environmental and behavioral factors related to weight management among medically at risk obese adults. Viewing obesity as a mild form of deviant behavior, the investigation addressed obesity as a learned behavior and related it to social learning theory and strain theory from three perspectives. Environmental and behavioral factors which influence the acquisition of attitudes and behavior relating to food and eating, along with factors contributing to or interfering with adherence to a weight management program, were examined. Differences in these factors between obese and nonobese populations were also examined.

Subjects for the study were 106 participants in a medically managed protein sparing modified fasting regimen combined with behavior modification. A comparison group of 53 subjects who were not identified as obese and were not participating in a protein sparing modified fast were surveyed on a single occasion and responses compared with the obese population.

A questionnaire was administered at weeks 1, 13, and 25 of the 26-week program. The social learning and strain factors were correlated with duration of treatment and total amount of weight reduction.

Differential reinforcement, the balance of reinforcing and repressing consequences, experienced by the clients in a long term weight management program was found to be a statistically significant factor in relation to both duration of treatment and amount of weight reduction achieved. The relevance of specific factors varied according to the stages of the treatment program, thus providing clinical implications.

Statistically significant findings related to differential association supported the importance of the role of friends as well as family in the overall weight management process. The higher incidence of obesity among spouse and other primary groups besides the family reported by the treatment group, in contrast to the comparison group, supported the importance of social factors as well as genetics in obesity.

Specific behavioral traits and attitudes relating to food and eating were identified which were statistically correlated ($p<.05$) with the segment of the treatment program in which clients would experience the greatest difficulty. In addition, these behavioral traits were statistically correlated ($p<.05$) with the duration of treatment and amount of weight reduction achieved. The greater the extent to which eating habits conducive toward obesity (rapid eating and frequent snacking) are carried from childhood into adulthood, the greater the difficulty experienced in adherence.

Findings of the study demonstrated the importance of environmental and cultural factors in the condition of obesity. On the basis of these findings, treatment programs would benefit by incorporating a sociological as well as a physiological and psychological perspective.

CHAPTER I
INTRODUCTION

Clinical Relevance

Recognition of the significance of environmental and behavioral impact on illness and health care needs has long been a hallmark of psychiatric nurses. Reflecting the influence of Harry Stack Sullivan (1953) in his theory of interpersonal psychiatry and the early nursing theory of Hildegarde Peplau (1952), the recognition that behavior is purposeful, meaningful, learned, and capable of being changed has provided a framework of practice for numerous nurses. This framework of practice has been employed in a variety of settings and with patients with different diagnoses with positive results.

As nursing theory developed, Imogene King (1981) proposed a conceptual framework for nursing, based on the process of interaction which evolved into a theory of goal attainment. Recognizing the importance of interaction of nurse and client, King also acknowledged their interaction with the social system or environment. She described individuals as "social, sentient, rational, reacting, perceiving, controlling, purposeful, action-oriented, and time-oriented" (p. 143). King recognized both client and nurse as psychosocial beings.

The continued importance of environmental and behavioral issues in nursing practice was noted by the American Nurses' Association Cabinet on Nursing Research (1985) as they included these areas among nursing's research priorities for the next decade. One of the priorities specifically addressed research needs designed to identify information and techniques which will minimize or prevent behaviorally and environmentally induced health problems that compromise the quality of life and reduce productivity. This statement by the Cabinet on Nursing Research reaffirmed the impact of such illnesses on the quality of life in Twentieth Century America (ANA, 1985).

One of the predominant illnesses frequently identified as behaviorally and environmentally induced is obesity, that is, more than 30% over ideal body weight (Matz, 1987). Although obesity is considered by some to be one of the eating disorders, it is not included among them in the Diagnostic and Statistical Manual of Mental Disorders-R (DSM-R) (APA, 1987), hereafter referred to as DSM-R. That publication notes that simple obesity is included in the Clinical Modification of the World Health Organization's International Classification of Diseases, 9th Revision (1978) as a physical disorder since "it is not generally associated with any distinctly psychological or behavioral syndrome" (DSM-R, p. 65).

Whether or not obesity is part of a behavioral syndrome does not eliminate the fact that it is frequently behaviorally induced. Type and amount of food consumed, combined with a sedentary lifestyle, reflect a mode of behavior. While genetics cannot be ignored as a contributing factor, the behaviors that are learned in the setting of family and peers are influential in the acquisition and maintenance of obesity. This has led to the incorporation of behavioral modification as a primary component in many weight loss programs.

With the increasing emphasis on wellness and preventive care, nurses are assuming important roles in weight loss clinics. These roles vary from the physical aspects of care to the behavioral programs which are essential if sustained weight loss is to be achieved (Wadden and Stunkard, 1986). If nurses are to be optimally effective, it is important that they recognize and understand the theoretical basis for their nursing practice. The effectiveness of behavioral modification is linked to the social learning theory from which it has evolved.

Purpose and Goals

The purpose of the study was to examine the environmental and behavioral factors influencing weight management among medically at risk obese adults from the perspective of social learning theory (Akers, 1985) and strain theory (Merton, 1968). The study addressed the problem of weight management from a sociological rather than a biological or psychological

perspective, viewing obesity as a type of deviant behavior. Social learning and strain factors and their relative contribution to the duration of adherence to treatment and amount of weight reduction achieved in a weight management program were examined from three perspectives: first, to explore and describe environmental and interactional factors which influence the acquisition of attitudes and behaviors relating to food and eating (primarily to include family and peer influence from the aspect of differential association, imitation, and definitions); second, to identify environmental and behavioral factors which contribute to or interfere with the duration of adherence to treatment and weight reduction achieved (to include differential reinforcement and differential association); third, to examine the environmental and behavioral factors which differentiate between obese and nonobese populations.

The specific goals were, first, to examine preexisting factors which may differentiate those patients who are adherent from those who are nonadherent in weight management programs; second, to identify specific treatment interventions which patients perceive as helpful or detrimental to their adherence to such programs; third, to determine those traits or experiences which may differentiate an obese from a nonobese population, thus clarifying specific etiological aspects of the condition.

The dependent variables (hereafter referred to as response variables) used to differentiate between the adherent and nonadherent patient were the number of weeks the patient remained in treatment and the amount of weight reduction. This information will be useful in determining the relative importance of internal traits versus external interventions influencing adherence in weight loss programs for the medically at risk obese adult.

The ineffectiveness of most weight loss programs in the achievement and maintenance of weight reduction among those entering such programs was noted by Stunkard (1958, p.147), "Most obese persons will not stay in treatment for obesity. Of those who stay in treatment, most will not lose weight and of those who do lose weight, most will regain it." The complexity of the physical aspects of the condition is addressed by the medical community. Investigation of

the environmental and behavioral factors influencing obesity and weight management is appropriate for nursing research that assumes a more holistic perspective.

Theoretical Perspectives

A preponderance of research on obesity in the 1970s addressed the possible causes such as set point theory and thermogenesis (Keesey & Corbett, 1984; Nisbett, 1972) and the majority of research in the 1980's has been directed toward the evaluation of newly developed treatment programs such as protein sparing modified fast, behavioral modification, aerobic exercise programs or combinations of any of those three approaches (Brownell, Marlatt, Lichenstein, & Wilson, 1986; Stalonas & Kirshenbaum, 1985; Stunkard, 1984; Wadden & Stunkard, 1986). A consideration which impacts both the development and the treatment of obesity consists of the environmental and behavioral factors which influence the evolution and maintenance of the condition of obesity.

While a great emphasis in current research is directed toward the influence of genetics, it should be noted that the interaction of heredity and environment exists in this condition. Although the tendency toward the disease may be inherited, the important influence of environmental factors which are learned from primary reference groups during the early developmental stages should be recognized. This study examines the environmental and behavioral factors which influence the care of the medically at risk obese.

Both environmental and behavioral aspects of society are included under social learning theory. It involves more than modern learning theory or the principles of classical and operant conditioning. It includes experimentally derived principles of behavior change from social and developmental psychology (O'Leary & Wilson, 1975).

These principles have been expanded to form the current basis for behavior therapy and behavior modification. Wolpe (1958), Lazarus (1958), and Eysenck (1959) were among the early proponents of behavior therapy based on the principles and procedures of behaviorism as

formulated by Pavlov, Hull, and Skinner (O'Leary & Wilson, 1975). Behavior modification, a treatment model based on social learning concepts, is currently a primary treatment modality for obesity and has proven especially successful in combination with a protein sparing modified fasting regimen and aerobic exercise (Matz, 1987; Stalonas & Kirshenbaum, 1985; Wadden, Stunkard, & Brownell, 1983).

Viewing obesity as a form of deviant behavior, the social learning theory factors are defined as follows by Akers (1985).

Reinforcement is the process whereby a response contingent stimulus has the effect of strengthening the response (increasing the probability of its recurrence). Differential reinforcement results when an individual comes to prefer one behavior over another because it has been more highly rewarded or less punished (relating to frequency, amount, and probability of reward/punishment).

Punishment is described as events following behavior that have the effect of repressing or weakening it (that is, decreasing its rate).

Definitions are the normative meanings given to a behavior, defining it as appropriate or inappropriate.

Differential association refers to the exposure or contacts (varying in frequency, duration, priority, and intensity) a person has with different groups and individuals. From these persons one learns definitions conducive to or counter to specific behaviors partly from the observation of such behaviors and partly from being exposed to their normative patterns (values and standards).

Imitation (modeling) is engaging in behavior after the observation of a similar behavior (closely related to differential association but is based more on observation of behavior being reinforced than on the adoption of standards and values).

A key element in Akers' theory addresses the concept of differentiation as it relates to differential association and reinforcement. Differentiation relates to the balance of differential

associations and balance of reinforcement/punishment with regard to a particular act or behavior pattern. Thus, the amount and quality of differential association and reinforcement which exist will determine their correlation with the acquisition of the specific behavior or condition which has been defined as positive, acceptable, or potentially reinforcing (Akers, 1985).

Aspects of strain theory and anomie (Merton, 1968) are also examined in relation to obesity and weight management. Strain is related to discrepancy between societal goals or ideals and acceptable means to achieve such goals. The rationale for this inclusion is based on viewing health and beauty as "cultural goals" (Merton, 1968). Merton observed that certain socially generated pressures or forces drive people to certain behaviors, thus inducing specific appetites. Although health and beauty have not been specifically addressed in this manner, the media frequently presents them to the public from this perspective on television and in magazines and newspapers.

When goals are constantly presented as desirable but, as in the case of the chronically obese, seemingly unattainable, frustration with self and with life in general may develop. This leads to a condition in society known as anomie, that is, a breakdown in the regulation of the individual's desires. In the case of obesity, such a breakdown could be evidenced in even greater weight gain or in some other form of eating disorder, such as anorexia or bulemia.

"Institutionalized means" (Merton, 1968) to facilitate the attainment of the goals of health and beauty are also proposed in the media. While a reduced calorie diet and a regular exercise program may be viewed as reasonable by some, the chronically overweight person is not likely to view them as such. Frustration and subsequent strain occur when the societally advocated methods of exercise and diet are adopted and failure to achieve the proposed goals persists because of decreased metabolism related to frequent dieting and a sedentary lifestyle. This reinforces the feelings of powerlessness or lack of control frequently experienced by the obese individual.

Merton (1968) described five modes of individual adaptation to anomie, formulated on the basis of personal acceptance or rejection of cultural goals and institutionalized means. These include 1.) conformity, in which both goals and means are accepted (for example, in weight management, an ongoing exercise regimen and dietary restrictions); 2.) innovation, in which goals are accepted and means are rejected (fad diets or exercise gimmicks are an example of this mode); 3.) ritualism, in which goals are rejected and means are retained (obsession with exercise or anorexia are examples of this mode); 4.) retreatism, in which both goals and means are rejected (those persons who simply disregard any practices relating to health and beauty with no apparent regret are examples of this mode); and 5.) rebellion, in which the individual responds by replacing societal goals with new ones and adopts means to achieve such goals (those overweight individuals who emphasize academic rather than physical prowess are examples of this mode).

Research Subjects

The weight management program providing the subject pool consists of a protein sparing modified fast combined with weekly behavioral modification classes and an exercise component (aerobic walking). Only those persons a minimum of or exceeding 30% or 50 pounds over ideal body weight are admitted to the program. A scientifically developed nutritional supplement which provides 420 or 800 calories and 70 grams of dairy source protein daily prevents loss of lean body mass while facilitating loss of fat. A state of ketosis is induced and the appetite diminishes while energy level frequently increases. Due to the naturally induced diuresis, major water and sometimes salt supplementation are necessary. However, the behavior modification is emphasized as the most important element in the program. The modified fast exists for 12 weeks but the total program of fasting, refeeding, and stabilization is 26 weeks in duration.

Since those individuals participating in a weight management program for the medically at risk obese adult will have undergone similar behavioral paths in arriving at this stage of obesity, it is likely there will be little variation in their definitions (attitudes), models, or differential associations. With the exception of amount of differential reinforcement in the weight management program itself, social learning and other background factors are anticipated to be similar. Therefore, in order to gain insight into the effect of these factors in differentiating between those who have become obese and those who are of normal weight, some comparison was needed between program participants and subjects in a normal population.

In order to make these comparisons, a second group of subjects who were not specifically identified as obese and were not participating in an organized weight control program were surveyed and their responses compared with the initial responses of the obese population being studied. Through the use of chi square tests, it was found that this group (hereafter referred to as the comparison group) consisted of subjects demographically comparable to those in the primary treatment group in all aspects except weight. Responses from this group were compared with those of the primary group to assess the difference in response variables between an obese population and the general population.

Objectives

The objectives related to social learning theory were based on the general proposition that behaviors, such as health practices, cooking methods, and eating habits, learned from primary reference groups (family and friends) will influence one's behaviors and attitudes toward the condition of obesity and subsequently influence an individual's adherence level in a weight loss program. Obesity or weight management ability should be related to the social learning factors, differential reinforcement, differential association, definitions, and imitation. Once participating in an organized weight management program, the length of time a person remains

in the program as well as total amount of weight reduction while in that program should be related to the same factors.

However, by the time an individual has reached the level of obesity (50 pounds or 30% over ideal body weight) to qualify for a program designed for the medically at risk obese adult, it is likely that participants will be similar with regard to past and present differential associations with normal weight and overweight family members and friends, attitudes toward obesity, and behavioral models. The chief difference among those who are relatively more successful in the program and those who are not, therefore, should be more related to the balance of reinforcing and repressing consequences for the persons at the time of participation in the program.

In the questionnaire, three major indicators of anomie were addressed (Merton, 1968). These include 1.) perceived locus of control, that is, whether or not one perceives his behavior as regulated by outside forces or under his own direction; 2.) perceived level of achievement of life goals, and 3.) level of life satisfaction. The two latter indicators were assessed in an effort to determine the individual's self concept related to feelings of success and self-fulfillment.

The following objectives were studied. The first four objectives are related to social learning theory (Akers, 1985) to determine whether 1.) the amount of differential reinforcement received for continuing participation in a protein sparing modified fast combined with a behavioral modification component (hereafter referred to as PSMF-BMC) correlates with the length of time in the program and the total amount of weight reduction during that period; 2.) the definition of (attitudes toward) obesity correlates with the length of time in the program and the total amount of weight reduction during that period; 3.) the amount of differential association with obese persons correlates with the length of time in the program and the total amount of weight reduction during that period; and 4.) the similarity of current eating behaviors and attitudes toward food to those observed in the childhood home correlates with the length of time in the program and the total amount of weight reduction during that period.

The next three objectives are related to strain theory and anomie (Merton, 1968) to determine whether 5.) the level of perceived success in achieving life's goals correlates with the length of time a participant adheres to the program and the total amount of weight reduction during that period; 6.) the level of life satisfaction correlates with the length of time in the program and the total amount of weight reduction during that period; 7.) the level of internal locus of control correlates with the length of time in the program and the total amount of weight lost during that period.

The following objectives address the comparison of a group consisting of persons not specifically identified as obese and not currently participating in a weight control program with those individuals in the PSMF-BMC. These were studied to determine whether 8.) the level of differential reinforcement for weight management differs between obese and nonobese persons; 9.) the perception (attitudes and definition) of obesity differs between obese and nonobese individuals; 10.) the degree of differential association with obese persons differs between obese and nonobese persons; 11.) the similarity of current eating behaviors and attitudes toward food to those of the childhood home differs between obese and nonobese persons; 12.) perceived success in achieving life's goals differs between obese and nonobese persons; 13.) the level of life satisfaction differs between obese and nonobese persons; and 14.) perceived level of internal locus of control differs between obese and nonobese persons.

CHAPTER II
REVIEW OF LITERATURE

Akers proposes that deviant behavior can be explained by general behavioral principles in terms of operant conditioning (1985). Four primary social learning factors are included: differential reinforcement (reward and punishment), differential association, definitions, and imitation (modeling). In order to more fully understand this model, a perspective of the evolution of the theory from Pavlov to Akers is appropriate.

Historical Perspective

Classical Conditioning and the Conditioned Reflex

Ivan Pavlov, a Russian physiologist, devoted the last thirty years of his life to the study of brain function. In his most famous study, utilizing dogs, it was reported that, by repeated differential association, an artificial stimulus (such as a bell) could be substituted for a natural stimulus (food) and cause a physiological reaction (salivation). He called this a conditioned reflex. Pavlov believed that all acquired habits depended on chains of conditioned reflexes. This is an example of respondent behavior. Pavlovian conditioning came to be identified as "classical conditioning" (Pavlov, 1927).

Respondent behaviors are reflex or involuntary responses and are controlled primarily by the autonomic nervous system. Respondents are contingent upon antecedent or eliciting stimuli. Although some reflexes respond automatically to certain unconditioned stimuli like heat and food, conditioned responses are still appropriately labeled respondent in that they are elicited by a prior stimulus. These behaviors are unaffected by the outcome or change they produce in the individual's environment (Akers, 1985).

Instrumental Conditioning and Operant Behavior

Voluntary responses which involve the large striated muscles and are mediated primarily by the central nervous system are termed operant behavior. Operants, in contrast to respondent behaviors, are capable of being influenced by the stimulus events which follow them. The form and rate with which operant behavior occurs are dependent upon instrumental conditioning. According to this theory, the behavior is acquired or conditioned by external stimuli which may consist of the effects, outcomes, or consequences it has on one's environment. That is, operant behaviors are developed, maintained, and strengthened (and conversely may be deterred or repressed) contingent upon their results. Social behavior, conforming and deviant, is predominantly operant (Akers, 1985).

Operant conditioning was demonstrated by B.F. Skinner in experiments with pigeons. According to Skinner, one of the pigeon's inborn behaviors is the peck. Skinner placed a target in the pigeon cage and when the pigeon pecked the target, an automatic machine fed it grain. Because of this, according to Skinner's objective, the probability of the pigeon pecking the target again increased. In Skinner's terms, the pigeon behavior in pecking the target is operant; the operant has been reinforced; grain is the reinforcer; and the pigeon has undergone operant conditioning. In summary, because the behavior is reinforced, it is more likely to be repeated. These findings provided the basis for Skinner's learning theory (Skinner, 1938).

Response Contingency Variables: Basis for Exchange Theory

The sociologist, George Homans, adopted and subsequently adapted Skinnerian psychology in his evolution of social exchange theory. Homans elaborated on the contingency factors, stimulus, activity, and reinforcement, and proposed that such contingencies bring the behavior of the organism under increasing control by the physical and social environment. Homans notes that these contingencies may also relate to punishment or adversive stimuli. The situation can be further complicated by the coexistence of reinforcements (such as the taste of good food or the pleasure of sharing a meal with friends) and unavoidable punishment (such as

the discomfort of overeating or the embarrassment of excessive weight gain) and the issues of benefit and cost then become influential factors. In addition, satiation and deprivation are considered as factors influencing the response to a specific reinforcer.

Several principles relating to the influence of reinforcement and the behavior of animals are proposed by Homans. These include the following. The more often an activity is reinforced, the more often the animal emits it; the more often an activity is punished, the less often the animal emits it. The more fully an animal has been previously deprived of a positive reinforcer, the more often it emits an activity so reinforced; the more fully it has been satiated, the less often it does so. The withdrawal of a positive reinforcer releases the emotional behavior described as aggression and the presentation of a positive reinforcer may result in, not only the reinforced activity but, some degree of positive emotional behavior. Any increase in the frequency of a particular activity entails a decrease in the frequency of an alternate activity. Homans notes that these propositions hold only if other things are equal (Homans, 1961).

Differential Association Theory of Criminal Behavior

Edwin H. Sutherland, a twentieth century sociologist, developed a theory of criminal behavior which was significantly influenced by George Herbert Mead and his theory of symbolic interactionism (1947). Sutherland's theory contains two basic elements. The first element identifies the content or cognitive elements of what is learned, that is, techniques, motives, and rationalizations, and definitions favorable to law violation. The second element identifies the process by which learning takes place. He proposes that learning occurs through associations in intimate personal groups.

Both of these elements are derived from Mead's symbolic interactionist theory (1934). The description of content is based on Mead's proposition that persons act toward things on the basis of the meanings those things have for them. Mead regarded meaning as the central factor in the explanation of behavior and assessed the influence of psychological or social conditions in terms of the meaning those conditions have for the individual (Vold & Bernard, 1986). The

element of process comes from Mead's argument that the meaning of things is derived from one's social interactions with associates. Sutherland specified the key characteristics of those associations as frequency, duration, priority, and intensity (Sutherland, 1947).

Sutherland's theory contains nine major points regarding the acquisition and continuance of delinquent behavior. These include 1.) criminal behavior is learned; 2.) the learning occurs in interaction through communication; 3.) the principal part occurs within intimate personal groups; 4.) learning includes techniques and motives; 5.) the motives are learned from definitions of the legal code as favorable or unfavorable; 6.) delinquent behavior occurs because of an excess of definitions favorable rather than unfavorable to law violation (known as the principle of differential association); 7.) differential associations may vary in frequency, duration, priority, and intensity; 8.) process of learning criminal behavior involves all of the mechanisms that are involved in any other learning; and 9.) although criminal behavior is an expression of general needs and values, it is not explained by those general needs and values because these also apply to noncriminal behavior (Sutherland, 1947).

Strain Theory of Deviant Behavior

Robert Merton pointed out that many of the appetites of individuals were not necessarily natural but were societally induced (1968). The general premise of strain theories is that there are certain socially generated pressures or forces that drive people to commit crimes. Merton noted that the culture of any society defines certain goals worth striving for and these may vary from culture to culture. He observed that in the American culture, the most prominent cultural goal was the achievement of wealth (acquisition of material possessions). This accumulated wealth is frequently equated with personal value and worth and may be associated with a high degree of prestige and social status.

Cultures also specify approved norms or "institutionalized means" which dictate the manner in which individuals are to pursue the societal goals (Merton, 1968). Merton stated that in the American culture the institutionalized means as well as the goals reflected "middle-class

values," for example, material possessions, power, health, beauty, or physical prowess. He observed that because all persons cannot achieve the goals of the culture, it is important that the culture emphasize the institutional means and the importance of adhering to them for their own value in order to assure conformity in spite of inability to secure the identified goals.

Strain occurs when persons adhere to the means and are still unable to achieve the goals. Among those with the least possibility of attaining the goals, the strain is most apparent. This strain on cultural values then leads to a condition in society described as anomie, that is, a breakdown in the regulation of the individual's desires.

Merton viewed anomie as a permanent feature of American society and perceived the source of the problem as cultural rather than due to human nature. That is, the condition related to societal goals and institutionalized means that were inaccessible to some members of society and were, therefore, a source of frustration and subsequent anomie. It was this element that convinced Merton that such problems were social in nature rather than due to some psychological or moral weakness in the individual.

Five potential modes of individual adaptation to anomie on the basis of personal acceptance or rejection of cultural goals and institutional means were described by Merton. These include 1.) conformity, in which the individual accepts both the goals and the means; 2.) innovation, in which the individual accepts the goals and rejects the means; 3.) ritualism, in which the individual rejects the goals but retains the means; 4.) retreatism, in which the individual rejects both the goals and the means; and 5.) rebellion, in which the individual responds by replacing societal goals with new ones with accompanying adaptation of means to achieve those goals (Vold & Bernard, 1986).

With the exception of conformity, Merton viewed all of these forms of adaptation as deviant. He acknowledged that the theory could account for only some forms of deviant behavior. The intention of the theory was to focus attention on "the acute pressure created by

the discrepancy between culturally induced goals and socially structured opportunities" (Merton 1968, p.197).

Although Merton did not specifically address societal values other than the achievement of wealth, his theory may be generalized to other norms which are overtly or covertly advocated in a society. Health and fitness, youth, and beauty are dominant themes evident in the current media. The issue of the significance of norms and models (for example, entertainers or sports figures) in the acquisition or reduction of specific behaviors is a common element in both Akers' and Merton's theories.

Obesity as a Mild Form of Deviant Behavior

Obesity as Contrary to Social Expectation

Chronic morbid obesity can be addressed as a mild form of deviant behavior rather than only as a medical entity. Obesity can be described as deviant behavior in that it is atypical or "contrary to the standards of conduct or social expectations of a given group or society" (Frank, et al., 1986, p.19).

Being overweight was identified as a form of social deviance twenty years ago (Maddox, Back, & Liederman, 1968). The authors observed that obesity tended to evoke a negative affect and rejection according to their findings. The overweight individual is frequently imputed to be responsible for his or her condition and this negatively affects social interactions. According to Maddox, Back, and Liederman (1968),

> The deviant career takes shape as the individual learns that the costs of resisting his role assignment as a deviant is less rewarding than playing the role; the deviant career, therefore, involves finding some satisfaction in the role, developing some protective justifications for continuing to play the role, and devising ways of minimizing punishment. (p. 287)

Attitudes toward oneself, with regard to weight gain, may reflect the rejection perceived in society. Negative experiences in membership groups may affect the development of intrinsically negative self-attitudes (Kaplan, Martin, & Johnson, 1986). Due to the distress experienced because of these attitudes, the individual may be motivated to deviate from normative expectations to find alternatives that will enhance self-esteem (Kaplan, Martin, & Johnson, 1986). For example, the person who is ridiculed or alienated because of his or her physical appearance may compensate by developing other attributes, such as physical strength or intellectual achievements.

Nonconforming Behavior in a Fitness Oriented Society

In a society which emphasizes health and fitness, personal appearance, and thinness, the condition of chronic obesity is a nonconforming behavior. Eating disorders are also being addressed under the category of addictive behaviors (Hollis, 1985; Orwood, 1985) and as such can be classified as deviant behavior. Obesity is commonly disapproved of by persons in segments of American society and obese people are often viewed as morally blameworthy for their inability to control their appetites and, subsequently, their weight (Maddox, Back, & Liederman, 1968).

Social Learning Theory of Deviant Behavior

Overview

Akers proposes that deviant behavior can be explained by general behavioral principles in terms of operant conditioning (Akers, 1985). Five primary social learning factors are included: differential reinforcement, punishment, differential association, definitions, and imitation (modeling). Akers provides a reformulation and expansion of the theory of Sutherland (1947) which implies that behavior is identified as positive or negative, acceptable or unacceptable, as a result of associating with others who hold such ideas or values.

The reformulation of the theory by Akers primarily consisted of the inclusion of differention as it relates to reinforcement taken from operant behavior theory. Thus, the greater the amount, the more frequent, or the more probable the reinforcement, the more likely it will influence one's behavior or attitudes. Such reinforcement may be either positive or negative. This is also applicable in the social learning factor of punishment. The other major change in the theory proposed by Akers was the expansion of the application of the theory from exclusively criminal deviant behavior (Sutherland, 1947) to apply to the acquisition of any form of deviant behavior (Akers, 1985).

An assumption of Akers' social learning theory is that deviant behavior does not differ as behavior from conforming behavior and both can be explained by behavioral principles. These principles relate to both operant behavior and respondent behavior. Operant behaviors are mediated primarily by the central nervous system, involve the large striated muscles, and are voluntary. Respondent behaviors are controlled by the autonomic nervous system, involve smooth muscles, and are reflex or involuntary (Akers, 1985).

Respondent behaviors are contingent upon antecedent or eliciting stimuli and unaffected by the outcome or change they produce in the environment. This is illustrated by physical hunger pangs which prompt a person to seek food. In contrast, operant behaviors are capable of being influenced by the stimulus events which follow them. For example, the sedating effects of alcohol consumption may reinforce that behavior in an anxious person who becomes relaxed following the ingestion of alcohol. Although reflexes respond automatically to unconditional stimuli, they can be conditioned to be elicited by conditional stimuli as in classical conditioning. However, the response is still elicited by a prior stimulus (Akers, 1985).

Social behavior, including deviant behavior, is predominantly operant. This behavior is acquired or conditioned by the effects, outcomes, or consequences it has on the person's environment. Because these responses are not simple reflexes, they are capable of developing a functional relationship with stimulus events. They can be developed, maintained, and

strengthened (or conversely avoided or repressed) depending on the feedback received or produced from the environment. While respondent behavior is controlled by the preceding stimulus, operant behavior is controlled by its consequences. Therefore, the two major factors in instrumental conditioning which are included in social learning theory are reinforcement and punishment (Akers, 1985).

Differential Reinforcement: Balancing Reinforcement and Punishment

Reinforcement is the process whereby a response contingent stimulus has the effect of strengthening the response. In the interpersonal situation, this relates to reactions from others. Two kinds of consequences affect behavior in this manner. Positive reinforcement occurs when actions are followed by pleasing or desirable events and the behavior is thus strengthened. The positive reinforcer may also be something physically consumed, for example, food, drink, or drugs. The positive reinforcer is characterized by something desirable, tangible or intangible, being added to the individual or his environment (Akers, 1985).

In contrast, negative reinforcement is based on avoiding or removing a distasteful stimuli from the environment. Behavior maintained in this way is usually termed escape/avoidance behavior because it's goal is to avoid adversive situations. Both positive and negative reinforcement increase the rate of behavior, the positive by reinforcing and the negative by avoiding a specific event (Akers, 1985).

Punishment occurs when the events following behavior have the effect of repressing or decreasing the rate of occurrence of that behavior. As in the case of reinforcement, punishment may be due to the addition or subtraction of stimulus events. Positive punishment occurs when some type of punisher is added as a consequence of a certain behavior. Negative punishment occurs when a privilege or reinforcement is removed as a consequence of a specific behavior (Akers, 1985).

Operant learning principles do not attempt directly to address what is or is not likely to be reinforcing or repressing. However, kinds and sources of reinforcement are incorporated into

social learning theory. Unconditioned or intrinsically reinforcing physiological stimuli, such as the satisfaction of hunger, thirst, or sex drives, are defined as nonsocial and help shape and maintain behavior. Recognition, approval, status, and acceptance are recognized as universal social reinforcers. There are also commonly valued reinforcements within a society, for example, money, which reinforce any behavior which achieves them. However, within a larger society, subcultures exist whose history, social structure, and value system may result in a variety of reinforcers which differ significantly from the general population (Akers, 1985).

Most of the learning relevant to deviant behavior is the result of social interactions. Social reinforcements may be tangible, such as money or material goods, or they may be intangible or symbolic. These may be reinforcing because they meet the universal social needs described above or because they fulfill ideological, religious, political, or other personal goals. It is the power and centrality of the direct reinforcements (money, awards, promotions) and symbolic reinforcements (praise, recognition, acceptance) in society which lead to labelling this theory social learning. Individuals learn which behaviors produce the desired results. The theory also recognizes that groups or individuals that comprise or control the major sources of an individual's reinforcement will have the greatest influence on his or her behavior. This may relate to the frequency of interaction, the status, or the perceived power of these influential persons. While these are usually primary groups, they may also be secondary or reference groups which would include the media and bureaucratic power groups (Akers, 1985).

Differential reinforcement has been identified by Akers (1985) as the specific process by which deviant behavior becomes dominant over conforming behavior.

> In the simplest terms, differential reinforcement means that given two alternative acts, both of which produce and are reinforced by the same or similar consequences, the one which does so in the greater amount, more frequently, and with higher probability will be maintained. (p. 47)

Although differential reinforcement is in effect when both acts are similar and one is more highly rewarded, it is most dramatic and effective when alternatives are incompatible and one is rewarded while the other is not rewarded (Akers, 1985)

Amount of reinforcement refers to measurable quantities of a reinforcer. Frequency and probability are based on schedules of reinforcement and are either continuous or intermittent. On a continuous basis, reinforcing stimulus immediately follows the response. Intermittent reinforcement refers to a time lapse between the response and the reinforcing stimulus. Continuous reinforcement has greater frequency than intermittent reinforcement. The latter is more common in society (Akers, 1985).

Differential Association and Imitation

Whether or not behavior is reinforced or punished depends on the values of those with whom one commonly interacts. "For this reason, the frequency, duration, priority, and intensity of differential association with deviant and nondeviant cultural and behavioral patterns have an impact on reinforcement" (Akers 1985, p.48). Therefore, differential reinforcement and differential association are strongly related.

Reference groups influence behavior by providing models for imitation. Imitation is described as engaging in behavior after the observation of a similar behavior. Whether or not the behavior will be imitated entails, in addition to observation, the characteristics of the models and the observed behavior. Models can be real (bodily present) or symbolic (media or verbally based). The degree of imitation is determined partially by the observer's feelings about the model and also by the observed results of the model's behavior (Baldwin & Baldwin, 1981).

Social learning theory presents two conceptions of imitation. Imitation may be viewed as a special learning process on the same level as instrumental and classical conditioning. Vicarious reinforcement occurs when individuals are not reinforced themselves but observe a model being reinforced for a certain behavior and subsequently emulate the actions of the model. Others view imitation as derived from direct operant conditioning, proposing that imitating

behavior is a learned ability acquired through direct reinforcement. Imitation is important in learning normative definitions and affects both conforming and deviant behavior. It is believed that imitation is more important in the acquisition and performance of behavior than in the maintenance of already established behavior patterns (Akers, 1985).

Definitions: Normative Meanings

In Sutherland's original version of differential association theory which addressed only the behavior of the criminally deviant, he noted two elements that are conducive to law violation: 1.) learning techniques which are necessary to conduct the deviant behavior and 2.) learning definitions which motivate persons to view the behavior in a neutral or positive manner (1947). Both of these items were retained in Aker's social learning theory (initially called differential association reinforcement theory) and applied to deviant behavior in general. Techniques relate to specific skills and could include shopping, cooking, and food selection when considering the problem of obesity.

According to Akers, definitions are the normative meanings which are given to behaviors, that is, identifying a specific behavior as right or wrong, good or bad. This is manifested in beliefs, values, and attitudes. Definitions are categorized as discriminative stimuli which are those stimuli associated with reinforcement. They provide cues for reinforcement. They allow an individual to recognize situational cues which make a specific behavior appropriate or inappropriate in a particular setting. Verbal symbols provide social reinforcers that become discriminative in social interactions (Akers, 1985).

Desirable or permissible acts are given positive definitions. These definitions would be associated with positive reinforcement through the reactions of others who share one's values, attitudes, or lifestyle. The acquisition of positive definitions counteract or neutralize definitions of behavior as undesirable and are referred to as neutralizations. This may be used as a form of rationalization or self-justification. For example, when one engages in a behavior that has previously been considered objectionable, the individual may attribute positive meaning to that

behavior in order to avoid feeling remorse or guilt. This tends to defend against or avoid punishment that is subsequent to social disapproval of a specific behavior, condition, or lifestyle. Neutralizations are reinforced in two ways. They may be positively reinforced by approval or acceptance by others who share the individual's lifestyle or condition. Negative reinforcement occurs when definitions successfully provide a defense against the criticism of those who do not share the same lifestyle or values, thus lessening the self-reproach and the discomfort of disapproval from others (Akers, 1985).

Differential association has both a behavioral and a definitional aspect. It consists not only of association with individuals who share a specific behavior or condition but also being exposed to their norms and values. This consists of those groups who make up the primary reference groups for the individual. Variations in association provide definitions and models and also influence the amount, frequency, and probability of reinforcement for a specific behavior, thus increasing the probability that definitions will become discriminative for deviance (Akers, 1985).

Social Learning Theory and Behavioral Modification

Although the study addresses the problem of obesity and weight management from a sociological rather than a psychological or biological perspective, it is appropriate to acknowledge the contributions of Bandura (1969, 1977a) who addresses social learning theory from a psychological perspective. According to Bandura, social learning theory is a comprehensive approach to human functioning in which both deviant and conforming behavior are assumed to be developed and maintained on the basis of three distinct regulatory systems. External stimulus events control some response patterns, primarily through classical conditioning processes. External reinforcement, the main focus of operant conditioners, is a second form of behavioral control. The third system of behavioral control operates through cognitive mediational processes, that is, a continuous reciprocal interaction of personal cognition and external stimuli (Bandura, 1977a). It is the third element of Bandura's theory which

differentiates it most clearly from similar sociological theories. Self-regulatory processes are acknowledged, thus providing a theoretical link with behavioral modification.

In presenting his thoery of self-efficacy, Bandurar (1977b) acknowledged the relationship betrween cognitive process (knowledge based) and cognitive events (experience based). Both the psychological and sociological approaches to social learning theory are relevant to behavior modification. The premise that behavior is learned and can therefore be unlearned and replaced with more acceptable or productive behaviors provides the basis for behavioral modification.

Summary

Behavior modification is based on a model in which abnormal or undesirable behavior is viewed not as a symptom of some underlying disease process but as the way a person has learned to cope with the stress of adapting to a complex physical and social environment. Because of this, it is apparent that learning theory is the theoretical basis for behavior modification. Although behavior modification emphasizes the principles of classical and operant conditioning, it also draws from other branches of experimental psychology, such as, developmental and social psychology.

The extensive and effective use of behavior modification in the treatment of obesity contributes to the assumption that obesity is a learned behavior. The fact that the obese person is frequently perceived as deviating from the accepted health and social norms in American society, authenticates the classification of that condition as a mild form of deviance. Therefore, the choice of Akers' theory as a framework for an investigation of the environmental and behavioral factors relating to the acquisition and reduction of obesity is appropriate although it is not judged to be the exclusive explanation of a complex and prevalent disease.

Strain theory and the modes of individual adaptation presented by Merton (1968) relate to behaviors acquired in response to environmental or societal stress. Behavior modification may be considered a relevant treatment modality from this perspective in that individuals are taught alternative methods of coping with stress. In considering the environmental and

behavioral factors which influence weight management, it is, therefore, appropriate that Merton's strain theory be included in the framework for the investigation of this condition.

Related Research

Overview

Although obesity is sometimes included with eating disorders and is frequently viewed as an effect of an undesirable trait or maladaptive behavior by the general public, research addressing social learning theory and obesity is essentially nonexistent. Multiple studies have been conducted evaluating the effect of behavior modification as a treatment modality with obese patients but none have addressed the question of why it is an effective intervention. Other obesity studies tend to be epidemiological, examining the incidence of the disease without consideration of cause and effect.

This review of literature will address the major foci of research literature which has appeared in the last decade. Topics to be included are physiological factors; genetics; feminist issues; health seeking behaviors; treatment models; psychological perspectives; and addictive aspects. Readings have been reviewed from nursing, medicine, sociology, psychology, nutrition, addiction, and obesity publications.

Physiological Factors

Much of the earlier research addressed the causes of obesity. Set point theory describes an energy regulation model in which body weight is viewed as a physiological variable regulated at a specific level by a thermostat like mechanism thus explaining the regaining of weight following major weight loss (Keesey, 1986; Keesey & Corbett, 1984; Nisbett, 1972;). Thermogenesis proposes that the amount of calories burned in the digestion and utilization of energy intake is a factor in obesity (Danforth, 1980; Garrow, 1978). Energy balance equation suggests that an imbalance of caloric energy intake to the amount of energy expended is the primary factor in weight loss or gain (Booth, 1980; Stern, 1984).

Genetics

Hereditary factors are the focus of recent research. An adoptive study by Stunkard and associates (1986) evaluated a population of 540 Danish adoptees. There was a strong relation between the weight class (thin, median weight, overweight, and obese) of the adoptees and the body mass index of their biologic parents but there was no such relationship with the adoptive parents. These findings were present among a whole range of individual body fatness from very thin to obese. The findings emphasized the importance of genetic influences and the apparent insignificance of familial environment alone. However, it does not eliminate the possible mutual interaction of genetic and familial influences.

In a more recently reported investigation, infants of lean and overweight mothers were studied. Total energy expenditure and metabolizable energy intake were measured as well as postprandial metabolic rate. No significant difference was observed between infants who became overweight by the age of one year and those who did not. However, total energy expenditure at age three months was 20.7% lower in infants who became overweight. Investigators noted that findings suggested that reduced energy expenditure was an important factor in rapid weight gain during the first year of life (Roberts, Savage, Coward, Chew, & Lucas, 1988).

A recently publicized article reports further investigation of the concept of reduced energy consumption and the development of obesity, relating it to genetic factors. Utilizing a respiratory chamber, designed to reduce extraneous factors such as temperature and oxygen concentration, a 24 hour energy expenditure was measured on 95 southwestern American Indians. The investigators reported correlation of energy expenditure with the rate of change in body weight over a two year follow up period. In another 126 subjects, the resting metabolic rate at initial visit was found to predict the gain in body weight over a four year follow up. In a group of 94 siblings from 36 families, values for 24 hour energy expenditure aggregated in families. On the basis of these results, the investigators concluded that a low rate of energy expenditure may contribute to the aggregation of obesity in families (Ravussin et al., 1988).

While this study is being propounded as evidence of the genetic basis of obesity, the extraneous variable of environmental factors is not addressed. Familial similarity is recognized and genetic influences are undeniable but learned behavior is also transmitted through the primary reference group, the family.

Feminist Issues

Sociocultural aspects of obesity have been addressed in light of the Feminist Movement. Authors of such works as Fat is a Feminist Issue (Orbach, 1985) and "Food for feminist thought" (Charles & Kerr, 1986) discuss the issue from that perspective. In a qualitative study, Chares and Kerr interviewed 200 women who were mothers of preschool children. The overall focus of the study was issues of concern to this population. Body image was one of the issues addressed. Only 11.5% of those interviewed had never dieted or worried about their weight. Major conflicts relating to weight issues were identified as sexual desirability, the difficulty related to preparing and serving food for the family, and the stress of isolation from adults and subsequent boredom during the period of child rearing.

Health Seeking and Sustaining Behaviors

A recent nursing research study of obesity has investigated the influence of health behavior characteristics which include perceived weight, perceived health status, health conception, and health behavior choices. These characteristics were studied in two groups of subjects, one group (n=26) was overweight and the other (n=33) was of median weight. The two groups did not differ significantly in perceived health status (personal), health conception (theoretical), or health behavior. Ninety-two percent of the overweight and 36% of the median weight group perceived themselves to be overweight. Otherwise, no significant difference between the two groups was reported (Laffrey, 1986).

Factors influencing exercise adherence in overweight women was the topic of a study by Gillett (1988). Of the 38 women who participated in the study, 94% adhered to the program for the full duration of 16 weeks. Participant identified factors which influenced adherence were

group homogeneity; social networks among the participants; pleasurable feelings associated with increased energy and fitness; time limited duration of the program; commitment to an established goal; leader with a health related background; desire to change body image; and desire to improve physical health. Although this study related specifically to an exercise program, the reinforcing elements identified should be similarly identifiable in a dietary and behavioral modification program for the obese.

Client attrition in an obesity program for high risk clients prompted a nursing research study (White, 1984). The study addressed several research questions: 1.) reasons for entering treatment for obesity; 2.) importance of health as a motivator for weight maintenance; 3.) important reasons (what and why) for weight maintenance; and 4.) role of staff in reinforcing these motives. A factor isolating qualitative study was designed with open ended interview as data collection method. Three types of programs were utilized for data collection: 1.) a physician supervised high risk obesity clinic (n=62); 2.) a commercial dieting group (n=15); and 3.) a nurse directed dieting center (n=24). Ten percent of the subjects were male and the age range for all subjects was 21-71. Content analysis was utilized to categorize data relating to the reasons that clients entered treatment and two general categories were identified, body image and health/potency (performance). Gender was a significant factor in determining why a person entered treatment. Only 1 of the 12 men in the study reported body image as the primary factor while 67% of the females did so. Of the women who reported health/potency as a primary concern, most had recently undergone a major role change (divorce or widowhood). Although this study addresses motivating reasons for entering a weight loss program, the two areas identified, body image and health/potency, are also important reinforcers for remaining in a program.

Treatment Approaches

Much of the recent research has focused on the evaluation of treatment models and their effectiveness. Behavioral modification programs are now prevalent and many are part of a

program combined with a protein sparing modified fasting regimen (Orwood, 1985; Wadden, Stunkard, & Brownell, 1984). All have shown behavior modification to be an effective tool but to be more effective both in rate of weight loss and in maintenance of weight following the weight loss when combined with the very low calorie diet, a term used synonymously with the protein sparing modified fast (Matz, 1987; Wadden & Stunkard, 1986).

Additional research has attempted to identify factors which contribute to the successful weight reduction and the maintenance of weight loss (Barnstable, Klesges, & Terzbian, 1986; Marston & Criss, 1984; Perri, Lauer, McAdoo, McAllister, & Yancey, 1986; Wadden, Stunkard, Day, Gould, & Rubin, 1987). These studies focus primarily on the mode of therapy rather than on the individual differences in patients.

Psychological Perspectives

Psychological dimensions of obesity have been investigated but with minimal significant results. Most recent studies have reported little correlation between psychological well being and obesity (Kaplan & Kaplan, 1957; Leon & Roth, 1978; Rodin, 1978). However, personal interviews with obese individuals and with therapists who work with the obese reflect otherwise. Poor self-concept, lack of self-confidence, and accompanying anxiety and depression are reportedly more typical of the obese population who seeks treatment (Jacobs, 1987).

An extensive review of the psychological features of obesity emphasizes the importance of psychological factors from three perspectives, etiological risk factors, psychological consequences of the condition, and psychological influences related to treatment approaches (Rodin, Schank, & Streigel-Moore, 1989). Stigmatization and rejection of the obese by societal norms are identified as sources of diminished self-esteem and depression.

Locus of control was found to differentiate obese from nonobese subjects (Thomason, 1983). Obese subjects felt they had less personal control. This perspective results in an external locus of control but this may be a consequence rather than a precipitant of obesity. Research has indicated that those patients who maintain an internal locus of control have an advantage in

treatment because of the importance of self-motivation and self-direction (Silverman, Israel, & Shapiro, 1986).

Behavioral Consideration

Multiple studies have been conducted to determine whether or not obese persons eat more than nonobese persons. The majority of these studies have reported no difference in food intake between obese and nonobese persons (Rodin, Schank, & Striegel-Moore, 1989). However, one meal or a series of meals is not an adequate indicator of consistent food consumption. Many obese individuals acknowledge that food consumption is diminished in the presence of others and that over eating usually occurs in private (Jacobs, 1987).

Rapid rate of eating has been studied as a possible cause of obesity. However, studies that considered the rate of eating continuously throughout a meal did not find significant differences between obese and nonobese individuals (Mahoney, 1975; Warner & Balgura, 1975). Many behavioral treatment programs attempt to slow the rate of eating and this has proved helpful to some patients (Foreyt, Goodrick, & Gotto, 1981).

Food preferences, especially regarding calorie dense foods, high in fat and carbohydrate, may differentiate between obese and nonobese individuals (Thomason, 1983). The preference for sweet, fat dense foods may be a factor in either causing or maintaining obesity (Rodin, Schank, & Striegel-Moore, 1989). The elimination of calorie dense foods may also be related to the diminished hunger and preoccupation with food occurring in patients on a protein sparing modified fast (Wadden, Stunkard, Day, Gould, & Rubin, 1987).

Addictive Aspects

In an article utilizing a modified meta analysis, knowledge from the addictive disorders of alcoholism, smoking, and obesity, based on relevant research studies, was reviewed and integrated (Brownell, Marlatt, Lichtenstein, & Wilson, 1986). Determinants of relapse were discussed on the basis of three assumptions 1.) similar relapse patterns exist across addictive disorders; 2.) different processes govern initial change and maintenance and; 3.) interaction of

individual, situational, and physiological factors determine risk of relapse. In addition to physiological factors, individual and intrapersonal factors were identified as negative emotional states; inadequate motivation; response to treatment; and coping skills. Environmental and social factors were also identified. These included social support and environmental and external contingencies. The importance of proper screening procedures was emphasized and further research in that area was recommended.

Summary

The diverse approaches and conclusions presented in the reviewed research attest to the complexity of the problem of obesity. The problem has been approached primarily as a genetic and physiologic phenomena with regards to etiology. The emphasis has been directed toward a medical and psychological perspective in the treatment model. However, what is identified as cause does not seem to relate to what results in success or failure in treatment. Social and societal factors have been addressed minimally.

The environmental and behavioral factors relating to weight management are influential in the acquisition, maintenance, or reduction of weight. Therefore, a survey exploring social learning factors and strain theory in relation to obesity and weight management could provide theoretical as well as clinical insights.

CHAPTER III
METHOD AND MATERIALS

Design

Questionnaire Adaptation

A correlational study was conducted utilizing a self-report questionnaire that was administered pretreatment, midtreatment, and posttreatment. The questionnaire used was an adaptation of an earlier questionnaire developed and utilized by Akers (1979, 1985, in press) in previous studies correlating social learning principles and substance (tobacco, drug, and alcohol) abuse.

In selecting content relevant for an obese population, a research study and reports of interviews with obese individuals participating in a PSMF-BMC were utilized as information sources. The purpose of the research study conducted by Jacobs (1987) was to identify problems experienced by obese individuals. It consisted of in-depth interviews with eight obese females, ranging in age from 26 to 43, who were employed as professional nurses. Specific domains were identified in the study and several of these were incorporated into the questionnaire. Self-perception described as "being different, not fitting in" was addressed in the questionnaire under variables relating to differential association. Participants in the study consistently emphasized the role of food and eating in the family of origin. This concept was addressed in the segment of the questionnaire examining the similarity of current attitudes and behaviors regarding food and eating to those of the childhood home. Elements of self-doubt and diminished self-esteem were identified and were the basis for inclusion of questions describing one's perceived level of goal achievement and life satisfaction. The domain describing "private self, public self" in which obese individuals described variation in eating patterns according to whether or not they were

being observed provided the rational for inclusion of the questionnaire's segment on locus of control.

Reports of interviews with participants at all stages of PSMF-BMC provided information for statements describing experiences which facilitate or interfere with adherence to the weight management program. According to social learning theory (Akers, 1985), positive factors were viewed as reinforcers which should promote adherence and success in the program. Negative factors were considered repressers or punishers which interfere with or discourage adherence. Specific experiences consistently mentioned by program participants were included in the questionnaire under each of these categories.The selected design was appropriate for this particular study in that the participants were surveyed prior to treatment, at the conclusion of the supplemented fast, and again at the conclusion of their treatment experience. This permitted an initial response to questions without the influence of clinical intervention and provided a baseline for comparison with later responses. The midtreatment survey facilitated data collection from those participants who left the program postfast and prior to the conclusion of the total program. The schedule was also useful in determining if factors influencing adherence to the program differ in the fasting phase and the realimentation and stabilization phases of treatment.

Data Collection Instrument

Much of the questionnaire used was an adaptation of a similar questionnaire utilized by Akers in previous studies (1968, 1979, 1985, in press). The first page of the questionnaire obtains demographic data. The remainder of the questionnaire utilizes Likert type scale responses for questions relating to independent social learning variables being studied, differential reinforcement, differential association, imitation, and definitions. Similar questions relating to strain theory variables are included addressing perceived level of goal achievement, locus of control, and overall life satisfaction. (Refer to Appendix A.) Follow up questionnaires were an abbreviation of the original and included those questions relating to differential

reinforcement, perceived locus of control and life satisfaction. (Refer to Appendices B and C.) The basis for the selection of each of the indices is content validity, that is, the representativeness or sampling adequacy of the content of a measuring instrument (Kerlinger, 1984; Polit & Hungler, 1987; Wilson, 1985).

Validity and Reliability

Content Validity

A panel of ten judges was selected on the basis of academic, clinical, and research expertise in the field of weight management. They were requested to evaluate the items in the questionnaire on the basis of relevance for individuals participating in a very low calorie diet combined with behavioral modification treatment program for the medically at risk obese adult.

A form summarizing questionnaire content was developed and submitted to the judges for evaluation. (Refer to Appendix D). Members of the panel were requested to score each item as either highly relevant (one point), relevant (two points), or inappropriate (3 points). The questionnaire consisted of twelve categories with subtopics under each section.

Members of the panel included three nationally prominent individuals, currently active in obesity research. These included A.J. Stunkard, M.D. (Stunkard, 1958, 1984; Stunkard, et al., 1986; Wadden & Stunkard, 1986; Wadden, Stunkard, & Brownell, 1983; Wadden, Stunkard & Liebschutz, 1988;) and Kelly Brownell, Ph.D. (Brownell, 1984; Brownell & Foreyt, 1986; Brownell et al., 1985; Brownell, Marlatt, Lichtenstein, & Wilson, 1986; Brownell, Stunkard, & Albaum, 1980) of the University of Pennsylvania, and Colleen Rand, Ph.D. (Kuldau, Barnard, Kreutziger, & Rand, 1979; Kuldau & Rand, 1980; Rand & Kuldau, 1988; Rand & Stunkard, 1978, 1983) of the University of Florida who has been actively involved in obesity and weight management research for the past ten years. Clinicians currently working in very low calorie treatment programs comprised the remainder of the panel evaluating the relevance of the questionnaire content. Three dieticians and four behaviorists were surveyed. A minimum of a

masters degree and three years experience in their field of specialization were criteria for selection of the clinicians included.

To judge evaluator consensus, each of the segments was classified in three categories. Over 92% consensus was ranked highly relevant; 85-92% was ranked as relevant; and 75-84% was somewhat relevant. Items ranking under 75% were considered to be of questionable relevance. (Refer to Chapter IV under Content Validity for detailed results.)

Reliability

The response variables under consideration, amount of weight reduction and number of weeks in treatment, are objective numerical measurements. The baseline, midtreatment, and posttreatment weights were recorded on each subject remaining in treatment. For each client, the same scale was used to register the three different weights.

Procedural Trial

A trial study was conducted with patients who were current members of a PSMF-BMC weight loss program in Lake City to evaluate the questionnaire format and the length of time required for its completion. Minor problems related to format or explanation were noted and revised accordingly.

Research Concepts

Population

All individuals, a minimum of or exceeding 50 pounds overweight or 130% of ideal body weight, who are participating in a 26 week medical risk reduction weight loss program combining behavioral modification and a 12 week protein sparing modified fasting regimen consisting of either a 420 or 800 calorie nutritionally balanced supplement per day (hereafter referred to as PSMF-BMC).

Response (Dependent) Variables

The number of weeks one adheres to the PSMF combined with behavioral modification weight loss program plus total amount of weight loss during that period (converted to reduction in body mass index).

Factors for Evaluation (Independent Variables)

The social learning factors described earlier, differential reinforcement, differential association, imitation, and definitions, as measured in the weight management questionnaire described above. Perceived locus of control, level of goal achievement, and life satisfaction level will also be measured and correlated with the response (dependent) variables.

Extraneous Variables

In addition to demographic variables, the questions will include age at initial weight gain and motivation for entering the program.

Body Mass Index

In 1985, The National Institutes of Health Consensus Development Panel on the Health Implications of Obesity recommended that the body mass index be adopted in evaluating obese patients. The body mass index (body weight in kilograms/[height in meters]^2) is a simple measurement which is highly correlated with other estimates of fatness in that it minimizes the effect of height. It facilitates the comparison of populations. On this basis, weight reduction will also be converted to body mass index reduction.

Data Collection

The questionnaire (refer to Appendix A) was administered by the primary investigator with participants entering the PSMF combined with behavior modification weight loss programs (week 1) at four sites in central and north Florida. Twelve weeks later, as the fasting segment of the program was being completed, participants were resurveyed (refer to Appendix B). During week 25 of the 26 week program, the researcher returned to the sites to determine which

of the individuals were completing the total program and conduct a chart review to assess the number of weeks completed in treatment and the total weight loss achieved by those who left the program prior to its completion. Persons remaining in the program completed the final survey that evening and those who had left the program received survey copies by mail. The specific number of weeks in the program and the total weight loss achieved during that period, was obtained for all persons who were initially surveyed.

The purpose of the questionnaire completed by program participants was to determine which, if any, of the factors evaluated were related to success in the program. Questions relating to punishment and reinforcement, locus of control, and life satisfaction were readministered to those remaining in the program, at mid- and posttreatment testing, specifically addressing the experience in the PSMF-BMC in that particular segment of the weight management program. The remainder of the questionnaire was not readministered because it was determined that the demographic data and the number of obese family members and friends would not be altered due to participation in the program.

A similar questionnaire was mailed to those who had dropped out of the program at the time of both the second and third surveys. A second written notice with an additional copy of the survey was sent to those persons who failed to respond to the initial mail out survey.

Comparison Group

The questionnaire was also administered to a group of 26 students enrolled in a community college and to a group of 27 persons participating in a regional duplicate bridge tournament. The comparison group had no specific criteria for inclusion except that they not be participants in a weight management program resembling those in which the research subjects were members. An effort was made to stratify this sample according to the sex and age of the PSMF-BMC members, generally ranging between 21 and 71 years of age with approximately 20% male. Since the group was not in an organized treatment program, only the initial survey was administered.

The purpose of the comparison study was to determine whether or not an obese population differed significantly in attitudes and perception of obesity from a comparable nonobese population. Since all persons in the treatment program were obese, it was not possible to investigate factors differentiating the obese from the nonobese. Although several cultural attitudes toward obesity should be similar in the two groups, on the basis of differential association (Akers, 1985) the members of the obese group will be more likely to share similar attitudes and perceptions of obesity while the average weight persons should be more similar to each other than to the obese respondents.

Sample Selection

Because admission criteria for the PSMF-BMC are a minimum of 50 pounds or 30% over ideal body weight and between the ages of 18 and 70 years, all persons accepted to participate in the program were potential candidates for the study. The investigator met with the program participants at the initial session of the 26-week program. The study was explained and informed consent to participate was obtained. No patients were excluded unless they declined to participate, thus obtaining a convenience sample.

Groups varied in size from 7 to 18 participants. The number agreeing to participate in the study varied from 35% to 100% of the participants in each group. Utilizing four groups from Orlando, three groups from Orange Park, and two groups each from Tallahassee and Lake City, 106 subjects were recruited from a potential of 146 patients. Two individuals were ineligible for the study because they were less than 18 years of age.

Administration of Questionnaire

After explaining the study to the entering program participants, the questionnaire was administered by the principal investigator or her trained designee. Questions were answered privately as they arose and a memorandum made of any question that required clarification. This information was used to determine any specific items that were potentially problematic.

At the beginning of the 13th and again at the 25th week of the specific programs being studied, the investigator returned to each of the sites, met with those individuals remaining in the program, and administered the midtreatment and posttreatment questionnaires which were an abbreviated version of the original questionnaire. The questions included in follow up related to reinforcing and repressing consequences as related to the treatment experience, locus of control, and level of life satisfaction. Amount of weight reduction was noted at each of the visits.

A mail out questionnaire was sent to all persons who did not complete the program. Those clients who did not respond received a second written request including another copy of the questionnaire.

Initial surveys were conducted in June, July, and August and final data collection was completed in January. Therefore, total data collection efforts extended over eight months. Following administration of the questionnaires, the data were computerized for statistical analysis using SAS (Cody & Smith, 1987; SAS Institute, 1985; Schlotzhauer & Littell, 1987).

Limitations of the Study

Several limitations of the study must be acknowledged. In spite of the face validity of the questions and the previous use of a comparable format by Akers, the initial use of the questionnaire with a weight loss group necessitates some evaluation of the instrument as well as the data. Because of the straightforward character of the questions, problems should be minimal. The consensus of the ten member panel evaluating content validity of the study further reduces any major concerns in this area.

Because of the subject pool being drawn exclusively from north and central Florida, a certain amount of geographic bias may occur. However, because participants were selected from a variety of institutions, large and small, in both urban and rural areas, the problem of geographic bias should be minimal.

Based on the nature of the program and information available about past participants, the population of participants was generally representative of most organized weight loss programs in regard to age and sex, that is, with 10% of the participants being male and an age range from 21-71 (Millman, 1980; White, 1984). The treatment and comparison groups in this study each had 20% males rather than the usual 10%.

Analytic Procedures

The study consists of three continuous type response variables (number of weeks in treatment, amount of BMI reduction and amount of weight reduction) and four qualitative factors (independent variables) relating to social learning theory and three qualitative factors relating to strain theory which are composed of numerous indices or factor levels (Babbie, 1973; Marks, 1982a). The group of obese subjects (N=106) was compared with a group of nonobese (N=53) subjects utilizing the same factors (independent variables).

Descriptive statistics including mean, standard deviation, and range were calculated on quantitative factors such as weight, height, and age. Frequency distribution of responses to the qualitative questions were created utilizing percentages. This permitted comparison of the obese and nonobese groups in spite of difference in group size. Two sample t-tests and chi square tests were used to determine the significance of the difference between the two groups.

Correlations were calculated using the Pearson's product moment correlation coefficient used to describe the linear relation between each of the response variables and the mean total response score on each of the sets of questions in the questionnaire. Another measure of correlation, Kendall's Tau, was used to assess the element of differential reinforcement, comparing on an item by item basis responses to questions describing rewarding versus punishing behaviors. Kendall's Tau is based on the relative ranking for all pairs of observations. A pair of observations is concordant if the response ranks higher on both variables. A pair of

observations is discordant if the response ranks higher on one variable and lower on the other (Agresti & Agresti, 1979).

Stepwise multiple regression analysis was used as a form of exploratory analysis, providing insight into the relationships between the independent variables and the response variables. In the method used, variables are added one by one to the model and the F statistic for a variable to be added must be significant, otherwise it is discarded. As each new variable is entered, the partial F is adjusted on the basis of the current entry. The procedure continues until no variable meets the significance level required for entry and retention in the model (SAS Institute, 1982). In the SAS program used, $p<.15$ was the acceptable entry level. However, only those variables with a significance of $p<.05$ were treated as significant in the final interpretation of the data.

The primary function of the stepwise procedure is to evaluate question items regarding what appears to be the most useful set of predictors in a model. Its use was appropriate in this research from two perspectives. From a clinical standpoint, it suggested those factors most relevant in the treatment process. From the aspect of the research itself, it aided in the determination of those factors most relevant for inclusion in future studies.

CHAPTER IV
RESULTS

Description of the Samples

Treatment Group

Subjects in the study were 106 of a potential 144 patients who entered long term weight management programs (PSMF-BMC) during June and July, 1988. All patients entering the programs were invited to participate in the study. Thirty-eight persons (26.4%) elected not to do so.

Patients were recruited from programs in north and central Florida. Participating programs were located in Orlando (4 groups), Orange Park (3 groups), Tallahassee (2 groups), and Lake City (2 groups). Although the professional staff varied from clinic to clinic and group to group, the program admission criteria, format, medical protocol, and treatment regimen were identical in all of the programs. In the analysis of data, specific site or group was not considered. Instead, all patient data were combined as participants in a PSMF-BMC.

A profile of the total sample was obtained by calculating the mean, standard deviation, and the range of age, height, weight, and Body Mass Index, hereafter referred to as BMI (refer to Table 1). Frequency distributions were performed and revealed that 80% of the participants were female and 80.8% were employed full time. Of the participants, 67% were married and 56.8% had children living at home. The level of education ranged from high school diploma to graduate degree but the mean education level was 13.8 years with 64.4% of the group having completed at least some college.

At the time of the midtreatment follow up, 74 patients (69.8% of the original participants) remained in treatment. Follow up questionnaires were sent by mail to those patients who had left the program prior to the completion of the fasting phase. Of the 32

patients who had left the program, 7 (21.9%) responded to the questionnaire. Thus, postfast data was collected from 81 subjects (76.5% of the original participants).

When the final questionnaire was administered, 41 patients (38.7% of the original participants) remained in the treatment group. Follow up questionnaires were mailed to those individuals who had completed the fasting phase and some portion of the realimentation phase but had not completed the remainder of the program. No questionnaire was sent to the 5 participants who completed the fast but did not continue treatment thereafter. Of the 28 persons who received questionnaires, 4 (14.3%) responded. Thus, the final data were collected from 45 patients (42.5% of the original participants).

Comparison Group

Since all the subjects in the treatment group were obese, a comparision group was selected in order to determine whether or not an obese population differed significantly in attitudes and perceptions of obesity from a comparable nonobese population. The initial questionnaire was also administered to a comparison group that consisted of 26 students in a community college and 27 participants in a duplicate bridge tournament. The comparison group had no specific criteria for inclusion except that they not be participants in weight management programs resembling those in which the research subjects were patients. The goal was to survey a normal population, comparable to the treatment group in all aspects except weight and BMI.

A profile of this group based on mean, stand deviation, and range revealed similarity in age and height with differences in weight and BMI (refer to Table 1). Frequency distributions revealed that 75.5% of the control group were female and 25.5% were employed full time with an additional 25.5% employed part time. In this group, 67.9% were married and 42% had children living at home. Level of education ranged from eleventh grade to graduate degree and 78.8% of the group had completed at least some college.

Table 1: Physiologic Variables : Descriptive Statistics

TREATMENT Group (N = 106)				
Variable	Mean	S.D.	Minimum	Maximum
Age (years)	43.49	9.22	21.00	66.00
WT (pounds)	233.45	50.64	154.00	448.00
HT (inches)	66.19	3.39	58.00	74.00
BMI	36.69	6.60	26.57	63.23
CONTROL Group (N = 53)				
Variable	Mean	S.D.	Minimum	Maximum
Age (years)	43.66	17.43	20.00	75.00
WT (pounds)	157.71	39.72	100.00	262.00
HT (inches)	66.21	3.59	60.00	75.00
BMI	24.70	5.14	17.42	38.89

Two sample t-tests were performed to compare the continuous variables and while there was no significant difference in age and height, the differences in weight and BMI were significant at the $p<.0001$ level. A chi square was performed to assess group similarity on the basis of sex and marital status and no significant difference was noted.

Content Validity

Content validity was the method used to establish the appropriateness of the items included on the questionnaire. A panel of ten judges was selected on the basis of academic, clinical, and research expertise in the field of weight management. Members of the panel included three nationally prominent individuals currently active in obesity research. Clinicians presently involved in PSMF-BMC treatment programs, three nutritionists and four behaviorists comprised the remainder of the review panel. These individuals evaluated the items in the

questionnaire on the basis of relevance for individuals participating in a PSMF-BMC for the medically at risk obese adult.

A form summarizing the content areas included in the questionnaire was distributed to the panel of experts requesting that each item be scored as highly relevant (1 point), relevant (2 points), or inappropriate (3 points). The content of the questionnaire was summarized into twelve categories with subtopics under each section (refer to Appendix D).

Questions 1 thru 11 contained basic demographic data and item 12 elicited information regarding motivation for entering a weight management program. Question 13 elicited a description of differential association on the basis of weight and question 14 elicited estimates of the number of obese individuals, family, friends, and coworkers, with whom the individual regularly associated. The prevalence of obesity among family members was viewed as relevant in 98% of the responses. The existence of obesity among friends was considered relevant in 77% of the responses.

Question 15 asked about attitudes toward obesity and 95% of the panel viewed it as relevant in both family and friends although three members questioned the relevance of attitudes of children or grandparents toward obesity. Question 16 requested information about the attitude of the same individuals toward very low calorie diets. The attitude of family members and friends was rated as relevant in 85% of the panel member responses and the attitude of the spouse was considered highly relevant by the entire panel.

Question 17 considered the environmental factors which influence obesity based on the similarity of current attitudes and eating behaviors to those of the childhood home. On the basis of his recent research which emphasizes the genetic basis for obesity, Stunkard (1986), rejected this entire category. Three other dissenting judgments occurred, resulting in an overall 87% of responses which judged this category as relevant.

Question 18 addressed the level of goal achievement. Only one of the 30 possible responses in this category considered any aspect of the question to be inappropriate for inclusion.

The relevance of differential reinforcement was assessed in questions 19 and 20. Reinforcing (rewarding) experiences were included in question 19. The content of this segment was judged to be relevant in 98.5% of the responses. Question 20 contained descriptions of repressing (punishing) experiences. The content of this segment was judged as relevant by 91% of the panel members.

Internal versus external locus of control was the subject of items A thru J in question 21. This question evoked the most varied response from the panel of judges. However, this segment was judged relevant in 80% of the responses. Life satisfaction levels comprised the remainder of question 21. The judges viewed current life satisfaction as relevant (90%) and anticipated life satisfaction as somewhat relevant (80%).

All items included exceeded the 75% consensus level. On that basis, all items were retained in the questionnaire.

Evaluation of the Objectives

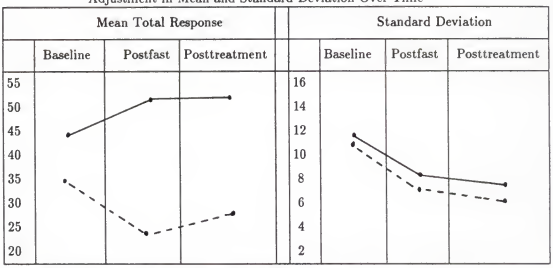
Objective 1

The purpose of this objective was to determine whether the amount of differential reinforcement received while participating in a protein sparing modified fast combined with a behavioral modification component (hereafter referred to as PSMF-BMC) correlated with the length of time in the program and the total amount of weight reduction during that period.

To evaluate the first objective, responses to questions 19 and 20 (each containing 15 individual items) were compared. Question 19 consisted of statements describing reinforcing consequences (rewarders) and question 20 consisted of statements describing repressing consequences (punishers). Descriptive statistics were used to demonstrate the changes in response pattern at different stages of the program. Among those subjects completing the total program, in the period between week 1 and week 25, the reinforcing factors showed an 7.45 increase in mean with a 4.70 decrease in standard deviation while the repressing factors showed

a 7.59 decrease in mean with a 4.30 decrease in standard deviation (refer to Table 2). Comparable changes also occurred in those subjects who did not complete the program.

Table 2: Differential Reinforcement:
Adjustment in Mean and Standard Deviation Over Time*



*Data in table represents subjects completing total program

Reinforcing consequences = ————

Repressing consequences = - - - - - - -

To further examine this objective, a Pearson's correlation was performed. Responses to questions relating to reinforcing and repressing experiences from each of the three visits were correlated with the response variables of weight reduction, BMI reduction, and duration of treatment. Data collected at the initial session showed no significant correlation for either question with any of the response variables. At the postfast data visit (week 13), responses identifying reinforcing consequences were positively correlated with postfast and total weight and BMI reduction and with number of weeks in treatment (refer to Table 3). At this point, repressing behaviors showed no significant correlation with any response variable.

The responses at the posttreatment visit (week 25) revealed that reinforcing consequences were positively correlated with total weight and BMI reduction, while the repressing consequences were negatively correlated with total weight and BMI reduction.

Neither the reinforcing nor the repressing consequences showed significant correlation with the total weeks of treatment (refer to Table 3).

Table 3: Pearson's Correlation: Mean Total Response with Response Variables

	Postfast			Posttreatment		
Mean Total Response	Weight Reduction	BMI Reduction	Weeks Treatment	Weight Reduction	BMI Reduction	Weeks Treatment
Postfast Response						
Reinforcing Exp.	.4223	.4518	.3631	.4233	.1623	.3515
p<	.0001	.0001	.0009	.0001	.1478	.0013
Repressing Exp.	-.1046	-.0811	.0484	-.1874	-.0252	.0146
p<	.3620	.4484	.6717	.0981	.8258	.8986
Locus of Control	.2850	.2933	.3012	.2597	.0817	.2715
p<	.0104	.0083	.0063	.0192	.4685	.0142
Posttreatment Response						
Reinforcing Exp.	.2338	.3225		.3815	.4589	-.0482
p<	.1222	.0307		.0089	.0013	.7506
Repressing Exp.	-.2169	-.2204		.3278	.3463	.0156
p<	.1573	.1506		.0280	.0198	.9193
Locus of Control	.0581	.0272		-.0123	-.0487	.0342
p<	.7045	.8595		.9352	.7421	.8241

In order to further clarify the relationship between reinforcing and repressing consequences, the responses were studied on an item by item basis (refer to Table 4). Utilizing a Kendall's Tau, responses to the two questions evidenced no discordant relationships at the baseline visit. These responses reflect expectations based on previous experience or hearsay. At the postfast data collection, discordant relationships were identified, that is, if reinforcing behaviors were positive, repressing behaviors were negative, thus indicating differential reinforcement (reinforcers balanced against repressers). The items demonstrating discordant relationships between repressing and reinforcing consequences were encouragement from family and sabotage by family; assistance from family and increased tension at home; sense of

achievement and discouragement due to slow weight loss; increased energy level and easily fatigued; and decreased interest in food and decreased pleasure from food.

Table 4: Kendall's Tau : Differential Reinforcement

Postfast Discordant Relationships		
Reinforcing Consequences	Repressing Consequences	Significance Level
Encouraged by family	Sabotaged by family	.0010
Assisted by family	Increased tension at home	.0039
Sense of achievement	Discouraged by slow loss	.0005
Increased energy	Easily fatigued	.0014
Decreased interest in food	Decreased pleasure	.0006
Posttreatment Discordant Relationships		
Reinforcing Consequences	Repressing Consequences	Significance Level
Complimented by family	Nagged by family	.0252
Complimented by friends	Teased by friends	.0027
Encouraged by family	Sabotaged by family	.0053
Sense of achievement	Discouraged by slow loss	.0021

At both the postfast and posttreatment visit, no concordant relationships were identified. Discordant relationships identified at the final visit were compliments from family and nagging by family; compliments from friends and teasing by friends; encouragement from family and sabotaged by family; and sense of achievement and discouraged by slow weight loss (refer to Table 4).

To further specify those behaviors most significant in relation to the response variables, a stepwise multiple regression analysis was performed. According to baseline data, decreased need for medication, positively correlated with total weight reduction and total BMI reduction. Being sabotaged by friends and being easily fatigued, negatively correlated with weight and BMI reduction (refer to Tables 5 & 6).

Table 5: Reinforcing Consequences:
Stepwise Regression Analysis of Baseline Responses

R^2	Factor	Significance Level	Model Coefficient
	No variables met the 0.1500 level for entry into the model		
	Weight Reduction: Total		
(N=40)	Intercept		267.81
.12	Decreased need for medication	.0258	10.83
.06	Encouragement from friends	.1111	-13.22
	BMI Reduction: Fasting Phase		
(N=40)	Intercept		6.26
.11	Decreased need for medication	.0349	0.38
	BMI Reduction: Total		
(N=40)	Intercept		32.91
.30	Decreased need for medication	.0002	2.04
.05	Support from group member	.0924	0.83

Postfast responses resulted in positive correlation of the reinforcing consequences of compliments from family with postfast weight reduction, and decreased preoccupation with food, with postfast weight and BMI reduction. Among repressing consequences, less contact with friends, was negatively correlated (that is, the higher the level of agreement, the lower the amount of weight lost) with postfast weight reduction and BMI reduction. This single item accounted for 41% of the variance in BMI reduction. (refer to Tables 7 & 8).

Four items included among repressing consequences (postfast) positively correlated (that is, the higher the level of agreement, the greater the amount of weight lost) with total weight reduction and total BMI reduction. These included guilt feelings after cheating, being sabotaged by friends, decreased pleasure, and being easily fatigued. Experiencing guilt feelings

Table 6: Repressing Consequences:
Stepwise Regression Analysis of Baseline Responses

Weight Reduction: Fasting Phase			
R^2	Factor	Significance Level	Model Coefficient
(N=43)	Intercept		49.63
.12	Easily fatigued	.0209	-3.62
Weight Reduction: Total			
(N=43)	Intercept		230.41
.12	Sabotaged by friends	.0230	-18.40
.06	Cravings for food	.1056	11.04
BMI Reduction: Fasting Phase			
(N=43)	Intercept		6.90
.09	Easily fatigued	.0484	-0.45
.06	Guilt feelings after cheating	.0949	0.68
.05	Discouraged by slow weight loss	.1259	-0.47
BMI Reduction: Total			
No variable met the 0.1500 significance level for entry into the model			

Table 7: Reinforcing Consequences:
Stepwise Regression Analysis of Postfast Responses Related to Postfast Achievement

Weight Reduction: Fasting Phase			
R^2	Factor	Significance Level	Model Coefficient
(N=21)	Intercept		50.02
.16	Decreased interest in food	.0634	7.08
.10	Increased energy level	.1265	12.43
.11	Support from group member	.0947	23.95
.11	Compliments from friends	.0693	-25.40
.17	Compliments from family	.0129	-16.74
BMI Reduction: Fasting Phase			
(N=21)	Intercept		6.94
.22	Decreased interest in food	.0290	1.35
.11	Increased self-confidence	.0867	2.50
Duration of Treatment: Fasting Phase			
No variable met the 0.1500 significance level for entry into the model			

Table 8: Repressing Consequences:
Stepwise Regression Analysis of Postfast Responses Related to Postfast Achievement

Weight Reduction: Fasting Phase			
R^2	Factor	Significance Level	Model Coefficient
(N=17)	Intercept		52.88
.24	Less contact with friends	.0375	-8.98
.17	Guilt feelings after cheating	.0567	-3.61
.12	Financial pressure	.0743	5.34
BMI Reduction: Fasting Phase			
(N=17)	Intercept		8.55
.41	Less contact with friends	.0040	-1.18
Duration of Treatment: Fasting Phase			
No variable met the 0.1500 significance level for entry into the model			

after cheating accounted for 36% of the variance in total weight reduction. Two items included among repressing consequences were negatively correlated with total weight reduction: decreased contact with old friends and nagging by family (refer to Table 9).

At the final visit, increased self-confidence was negatively correlated with total weight and BMI reduction, while increased energy level was positively correlated with postfast BMI reduction. Among repressing consequences, guilt feelings after cheating was negatively correlated with total weight reduction, and cravings for food was negatively correlated with postfast BMI reduction, (refer to Table 10 & 11).

The relationship of reinforcment to length of time spent in a PSMF-BMC, according to baseline responses showed a positive correlation (that is, the higher the level of agreement, the greater the time spent in treatment) with encouragement from friends. No other significant correlations existed (refer to Table 12).

At the postfast visit, stepwise regression analysis identified four items considered to be repressing consequences that negatively correlated (that is, the higher the level of agreement, the shorter the time spent in treatment) with the length of time individuals spent in treatment. These included: embarrassed by failure; feelings of hunger; nagging by family; and less contact

with old friends. Being embarrassed by weight gain accounted for 39% of the variance in duration of treatment. Only one item in this category, financial pressure, showed positive correlation with total time spent in treatment (refer to Table 9).

Table 9: Repressing Consequences:
Stepwise Regression Analysis of Postfast Responses Related to Posttreatment Achievement

Weight Reduction: Total			
R^2	Factor	Significance Level	Model Coefficient
(N=17)	Intercept		185.06
.36	Guilt feelings after cheating	.0085	32.19
.16	Less contact with friends	.0389	-16.01
.14	Nagged by family	.0340	-27.33
.10	Sabotaged by friends	.0342	41.92
.08	Decreased pleasure	.0280	17.45
.03	Embarrassed by weight gain	.1474	-15.91
.04	Financial pressure	.0692	-7.88
BMI Reduction: Total			
(N=17)	Intercept		32.41
.17	Less contact with friends	.0841	-4.05
.29	Guilt feelings after cheating	.0128	4.05
.18	Easily fatigued	.0207	1.94
.07	Embarrassed by weight gain	.0959	-5.50
.11	Sabotaged by friends	.0210	5.27
.05	Nagged by family	.0583	-1.92
.03	Teased by friends	.0940	2.95
.03	Financial pressure	.0996	0.97
Duration of Treatment: Total			
(N=17)	Intercept		28.09
.39	Embarrassed by weight gain	.0058	-1.13
.15	Financial pressures	.0448	1.78
.14	Feelings of hunger	.0307	-1.35
.13	Nagged by family	.0101	-2.09
.03	Uncomfortable side effects	.1376	1.33
.06	Less contact with friends	.0331	-1.41

Table 10: Reinforcing Consequences:
Stepwise Regression Analysis of Posttreatment Responses Related to Posttreatment Achievement

Weight Reduction: Total			
R^2	Factor	Significance Level	Model Coefficient
(N=20)	Intercept		359.11
.27	Increased self-confidence	.0162	-33.36
BMI Reduction: Total			
(N=20)	Intercept		51.54
.20	Increased self-confidence	.0433	-10.80
.12	Feelings of well being	.0859	6.96
Duration of Treatment: Total			
(N=20)	Intercept		27.84
.15	Decreased energy level	.0803	-2.24
.15	Decreased physical symptoms	.0670	1.19

Table 11: Repressing Consequences:
Stepwise Regression Analysis of Posttreatment Responses Related to Posttreatment Achievement

Weight Reduction: Total			
R^2	Factor	Significance Level	Model Coefficient
(N=23)	Intercept		279.38
.20	Sabotaged by friends	.0282	-30.23
BMI Reduction: Total			
(N=23)	Intercept		37.03
.14	Sabotaged by friends	.0740	-2.88
.09	Less contact with friends	.1240	2.01
Duration of Treatment: Total			
(N=23)	Intercept		28.62
.32	Teased by friends	.0038	-4.09
.12	Uncomfortable side effects	.0418	-1.33
.06	Guilt feelings after cheating	.1226	1.40
.09	Less contact with friends	.0586	-1.21

Table 12: Baseline Responses Related to Duration of Treatment: Stepwise Regression Analysis

R^2	Factor	Significance Level	Model Coefficient
Obese Family and Associates: Total Duration of Treatment			
(N=15)	Intercept		22.63
.22	Father	.0636	2.38
Resemblance of Eating Behaviors to Family of Origin: Duration of R_x: Fasting Phase			
(N=75)	Intercept		10.96
.06	Emphasis on cooking skills	.0306	0.80
.07	Snacking behaviors	.0218	-1.15
.03	Encouraged second helpings	.1462	0.48
Resemblance of Eating Behaviors to Family of Origin: Duration of R_x:Total			
(N=43)	Intercept		25.37
.05	Stressed clean plates	.1282	-0.65
Reinforcing Consequences: Duration of R_x:Total			
(N=40)	Intercept		19.48
.17	Encouragement from friend	.0081	1.83
.06	Support from group leader	.1036	0.45
.05	Assistance from family	.1292	-1.02
Repressing Consequences: Duration of R_x:Total			
(n=43)	Intercept		22.39
.06	Easily fatigued	.1219	0.52
Locus of Control: Duration of R_x:Total			
(n=44)	Intercept		21.81
.18	No such thing as luck	.0036	1.51
.07	Lack control over direction of life	.0560	-0.89

At the final visit, two items included under repressing consequences were negatively correlated with total time spent in treatment. These were teasing by friends and uncomfortable side effects. The negative effects of teasing by friends accounted for 32% of the variance in total duration of treatment (refer to Table 11).

Conclusion. Based on the significant findings reflected by descriptive statistics, Pearson's correlation, stepwise multiple regression analysis, and Kendall's Tau, demonstrating the inverse relationship of reinforcing and repressing consequences at both postfast and final data collections, it can be concluded that there is a correlation between differential reinforcement and the amount of time a participant remains in the PSMF-BMC and total weight and BMI reduction achieved.

The differences in success in the program can be attributed, to a significant degree, to differential reinforcement wherein the rewarding outomes of staying in the program and losing weight were greater, in balance, than the negative or repressing outcomes.

Objective 2

The purpose of this objective was to determine whether definition of (attitudes toward) obesity correlated with the length of time in the program and the total amount of weight achieved during that period.

Attitudes toward obesity were assessed in question 15 when the participant was asked to classify such attitudes as positive, negative, or neutral/empathetic. In addition to their own attitude, participants were asked to describe the attitude of family, friends, and associates. Frequency distributions describing personal attitudes showed that 61.7% of the participants indicated a negative attitude and 38.3% described their attitude as positive or neutral/empathetic.

To further explore the relationship of attitudes toward obesity, the mean total response to question 15 was correlated with the response variables of weight and weight reduction, BMI and BMI reduction, and duration of treatment. The results of the Pearson's correlation revealed no significant relationship between attitudes toward obesity and the response variables listed above.

A stepwise multiple regression analysis was used to identify the significance of attitudes of specific individuals toward obesity in relation to time spent in treatment and total weight and

BMI reduction. Baseline responses revealed a negative correlation between the perceived attitude of females in general and the amount of postfast weight and BMI reduction, that is, the more positive the attitude, the less the amount of weight and BMI reduction. Otherwise, there was no correlation with total weight or BMI reduction or with the length of time spent in treatment (refer to Table 13).

Conclusion. Based on the minimal correlations described above, it can be concluded that there is no significant correlation between attitude toward obesity and the amount of time spent in treatment and the amount of weight and BMI reduction. This indicates a homogeneity of definitions of obesity in this group which is not changed by the treatment experience. The majority of the overweight individuals have a negative attitude toward obesity and there is minimal variance within the group.

The general cultural definition of obesity is negative, that is, undesirable or deviant to be extremely overweight. The negative experiences connected with being obese and failing to lose weight or to maintain weight loss common to those who reach the point of entering a PSMF-BMC tend to reinforce the negative attitudes. One will not seek treatment for obesity if he or she is satisifed and favorably disposed toward obesity. Once in the program, there is no effort to induce positive attitudes toward being overweight. Instead, negative attitudes are reinforced. Therefore, whatever differences there are within the treatment group are not enough to make a difference in success in the program.

Objective 3

The purpose of this objective was to determine whether the amount of differential association with obese persons correlated with the length of time in the program and the total amount of weight reduction during that period.

The number of obese family members, friends, and associates of an individual was addressed in questions 13 and 14. Question 13 simply asked the individual to rate the body size of the majority of their acquaintances as underweight, average, or overweight. Frequency

Table 13: Attitudes Toward Obesity:
Stepwise Regression Analysis of Baseline Responses Related to
Weight and BMI; Weight and BMI Reduction

Weight: Initial			
R^2	Factor	Significance Level	Model Coefficient
(N=86)	Intercept		226.48
.06	Females in general	.0244	-10.77
.04	Self	.0524	10.88
Weight Reduction: Fasting Phase			
(N=64)	Intercept		33.48
.06	Females in general	.0348	-3.20
.05	Self	.0640	3.65
BMI: Initial			
(N=91)	Intercept		38.85
.07	Females in general	.0098	-1.35
.03	Mother	.0850	0.85
BMI Reduction: Fasting Phase			
(N=69)	Intercept		5.60
.07	Females in general	.0272	-0.44
.04	Self	.1053	0.44
Total Weight Reduction and BMI Reduction			
No variable met the 0.1500 significance level for entry into the model			

distributions were performed and 81.6% of the respondents stated the majority of their acquaintances were of average weight. Only 16.5% described the majority of their acquaintances as overweight. A Pearson's correlation was performed to assess the relationship of the response to this question to the amount of weight lost and the amount of time a participant adhered to the program. No significant correlations were present.

In question 14 the respondents were asked identify the number of overweight individuals with whom they were closely associated, family, friends, and coworkers. A frequency distribution was computed and showed that 46.4% identified their spouse as overweight. Female friends (70.6%), mother (60.2%), and grandmother (58.3%) were the largest groups identified as

obese. Father (49%), sisters (48%), and male coworkers (47.5%) formed the other major groups. However, a Pearson's correlation showed no significant correlation between the total number of obese individuals with whom one associated and the time spent in treatment or the amount of weight reduction.

In an attempt to identify the factors most highly correlated with the response variables, a stepwise multiple regression was conducted. In relation to postfast weight and BMI reduction, female friends, grandmother, and mother showed a negative correlation, (that is the greater the number of overweight individuals identified, the lesser the amount of weight loss). A greater number of obese female friends accounted for 37% of the variance in postfast weight reduction (refer to Tables 14 & 15).

The obesity of grandmother remained a significant factor, showing a negative correlation with total weight reduction. Obese male coworkers showed positive correlation (that is, the greater the number of overweight associates, the greater the amount of weight lost) with total weight and total BMI reduction. The incidence of overweight male coworkers accounted for 43% of the variance in total weight reduction. There was no correlation between the number of obese friends and associates and the length of time spent in treatment (refer to Tables 14 & 15).

Because differential association includes attitudes and opinions of associates, responses to question 15, addressing attitudes toward obesity, is a factor in this objective. As noted above, the minimal significance of this item would indicate little variation in the opinions of others. The group under treatment is fairly homogeneous with regard to association with obese and nonobese person. This homogeneity is slightly less than that reported in regard to attitude and is therefore slightly more related to program outcome.

Table 14: Overweight Family Members and Associates: Stepwise Regression Analysis of Number of Overweight Family and Associates Related to Weight; Weight Reduction

Overweight Family and Friends: Initial Weight			
R^2	Factor	Significance Level	Model Coefficient
(N=26)	Intercept		227.07
.20	Father	.0188	48.66
.17	Mother	.0159	-54.48
.10	Coworkers (male)	.0456	15.57
Overweight Family and Friends: Weight Reduction : Fasting Phase			
(N=22)	Intercept		57.12
.37	Close friends (female)	.0019	-5.16
.18	Grandmother	.0112	-9.90
.08	Mother	.0616	-9.80
.05	Coworkers (male)	.1301	3.44
.04	Father	.1339	6.58
Overweight Family and Friends: Weight Reduction : Total			
(N=15)	Intercept		283.90
.43	Coworkers (male)	.0057	25.07
.24	Grandmother	.0095	-57.12
.09	Sisters	.0502	-29.85
.04	Acquaintances (male)	.1384	-7.47
.04	Coworkers (female)	.1179	-4.88

Question 16 elicited information about attitudes toward very low calorie diets. However, the large number of responses in categories unknown, not applicable, and neutral resulted in limited data and further analysis was not done.

Conclusion. Based on results of the stepwise multiple regression analysis, there is evidence that differential association is correlated with length of time in the program and the amount of weight reduction but on a limited basis. The relationship is familial but also extends to close associates, both male and female.

Table 15: Overweight Family Members and Associates: Stepwise Regression Analysis of Number of Overweight Family and Associates Related to BMI and BMI Reduction

BMI			
R^2	Factor	Significance Level	Model Coefficient
(N=26)	Intercept		32.81
.17	Father	.0307	5.31
.16	Mother	.0268	-5.80
.10	Coworkers (male)	.0536	1.83
.11	Grandmother	.0359	3.78
Postfast BMI Reduction			
(N=22)	Intercept		8.81
.38	Close friends (female)	.0017	-0.73
.14	Grandmother	.0253	-1.20
.06	Mother	.1062	-1.03
.05	Coworkers (male)	.1433	0.36
Posttreatment BMI Reduction			
(N=15)	Intercept		33.81
.25	Coworkers (male)	.0476	1.80

Objective 4

The purpose of this objective was to determine whether the similarity of current eating behaviors and attitudes toward food to those observed in the childhood home correlated with the length of time in the program and the total amount of weight reduction during that period.

A variety of items describing behaviors and attitudes regarding food and eating are included in Question 17. Frequency distribution showed that only two items were viewed as not applicable by more than 10% of the respondents. Withholding food as a form of punishment was rated as not applicable by 22.9% of the respondents and not at all [similar] by 66.7%. The use of food as a reward was rated as not applicable by 14.2% of the respondents and as not at all [similar] by 33%. All other items ranged from 55-85% in their similarity to the childhood homes. A Pearson's correlation indicated a negative relationship between the resemblance of

past and present eating behaviors to those of family of origin and the individual's final BMI, $p<.0092$.

In an effort to determine if any specific attitudes or behaviors regarding food were of statistical significance, a stepwise multiple regression analysis was performed. Emphasis on cooking skills was positively correlated with postfast weight and BMI reduction. It was also positively correlated with length of time spent in treatment during the fast. Snacking behaviors were negatively correlated with postfast BMI reduction and with the length of time spent in treatment during the fast. Rapid rate of eating was negatively correlated with total weight and BMI reduction (refer to Table 16).

Conclusion. Although all behaviors and attitudes related to food and eating may not be significantly influential in determining adherence to a weight management program, it is clear that several specific behaviors are relevant at different periods in the program. Based on this observation, as evidenced in the stepwise multiple regression, and in conjunction with the results of the Pearson's correlation, it can be affirmed that there is a correlation between the similarity of current eating behaviors and attitudes toward food and those in the childhood home, to duration of adherence and the total amount of weight reduction.

The tendency toward overeating may be started in childhood. The greater the extent to which these eating habits and attitudes toward food conducive to obesity (rapid eating, frequent snacking, food as a reward) are carried over into adulthood, the greater the difficulty experienced in adhering to a weight management program.

Objective 5

The purpose of this objective was to determine whether the level of perceived success in achieving life's goals correlated with the length of time in the program and the total amount of weight reduction during that period.

Table 16:
Resemblance of Current Behaviors and Attitudes Regarding Food to Those of Childhood Home: Stepwise Regression Analysis Related to Weight and BMI; Weight and BMI Reduction

Similarity to Childhood Home: Initial Weight			
R^2	Factor	Significance Level	Model Coefficient
(N=100)	Intercept		258.24
.04	Food used as a reward	.0585	-9.44
Similarity to Childhood Home: Weight Reduction : Fasting Phase			
(N=75)	Intercept		25.58
.08	Emphasis on cooking skills	.0162	6.13
.04	Snacking behavior	.0786	-3.88
.03	Food withheld as punishment	.1217	3.79
Similarity to Childhood Home: Weight Reduction : Total			
(N=43)	Intercept		267.36
.19	Rapid rate of eating	.0031	-25.16
.05	Snacking behaviors	.0964	14.49
Similarity to Childhood Home: Initial BMI			
(N=100)	Intercept		41.26
.05	Rapid rate of eating	.0225	-1.58
Similarity to Childhood Home: BMI Reduction: Fasting Phase			
(n=75)	Intercept		5.47
.09	Emphasis on cooking skills	.0085	0.90
.05	Snacking behaviors	.0439	-0.66
Similarity to Childhood Home: BMI Reduction : Total			
(n=43)	Intercept		48.72
.27	Rapid rate of eating	.0003	-3.61
.05	Eating as a social event	.0828	-1.87
.04	Snacking behaviors	.1359	1.61

Success in achieving one's occupational, educational, and personal goals was assessed in Question 18. Frequency distribution showed that 54.7% of the respondents felt they had achieved their occupational goals and 33% did not; 45.3% felt they had achieved their educational goals and 36.8% did not; 35.8% felt they had achieved their personal goals and 46.2% did not. The responses in the uncertain category accounted for the missing percentages.

There was no significant correlation between total goal achievement and the length of time a participant adhered to the program or to the total amount of weight reduction. Stepwise multiple regression was performed to determine if a specific goal was significant. However, there was no significant correlation identified with any aspect of goal achievement in relation to duration of treatment or amount of weight reduction.

Conclusion. Based on the failure of either Pearson's correlation or stepwise multiple regression analysis to identify significant correlation, it cannot be assumed that successful goal achievement is correlated with adherence to a weight management program or amount of weight reduction while participating in such a program. Because of the homogeneity of the group in this regard, whatever subtle differences that existed were not enough to account for a difference in outcome.

Objective 6

The purpose of this objective was to determine whether the level of life satisfaction correlated with the length of time in the program and the total amount of weight reduction during that period.

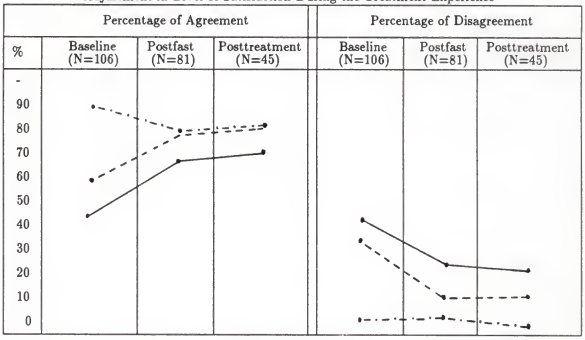
The three final items on the questionnaire address life satisfaction. Participants were asked to agree or disagree with satisfied with life today; more satisfied now than five years ago; and anticipate being more satisfied with life five years from now. Frequency distribution of responses varied at each of the three different visits. In the period between week 1 and week 25, positive responses describing satisfaction with life increased from 42.9% to 69.6%. In the same time frame, negative responses regarding life satisfaction reduced from 42.9% to 23.9% (refer to Table 17). These percentages include the total number of baseline respondents (N=106) and are compared with those who completed the postfast (N=81) and posttreatment (N=45) questionnaires.

Responses describing life satisfaction as compared with five years earlier, the range of

positive responses (more satisfied) progressively increased from 55.7% at week one to 78.3% 25 weeks later. Negative responses decreased from 34% in disagreement at week one to 13% at the conclusion of treatment (refer to Table 17).

Anticipation of being more satisfied with life in the future elicited high levels of agreement at each stage of treatment. It decreased from 88.7% at week 1 to 78.3% at week 25. Responses of those who disagreed accounted for less than 1% at week 1 and at week 25, no one disagreed but 19.6% were uncertain (refer to Table 17).

Table 17: Life Satisfaction:
Adjustment in Level of Satisfaction During the Treatment Experience



——— = Satisfied with life today

- - - - = More satisfied with life than five years ago

-·-·- = Anticipate being more satisfied five years from now

These items were incorporated in stepwise regression as part of question 21 and significant correlation was noted only at the final visit. Satisfaction with life today was negatively correlated with postfast BMI reduction. Anticipation of being more satisfied with life

was negatively correlated with total weight reduction (refer to Table 18).

Conclusion. Based on frequency distribution and stepwise multiple regression analysis, level of life satisfaction does not appear to be positively correlated with the length of time spent in treatment or the amount of weight reduction. However, it does seem to be affected by the length of time and the level of success achieved in the treatment program. This is based on the increasing percentages of life satisfaction at the chronological progressions of data collection

Table 18: Locus of Control and Life Satisfaction:
Stepwise Regression Analysis of Posttreatment Responses Related to Postfast Achievement

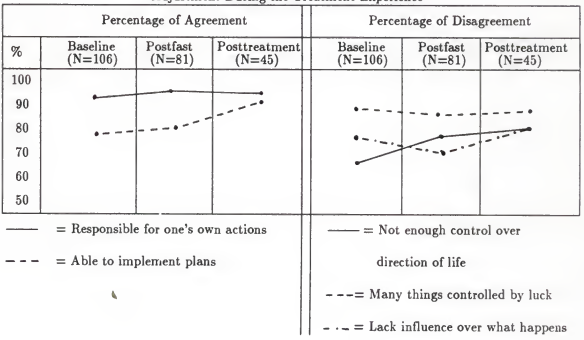
Weight Reduction : Total			
R^2	Factor	Significance Level	Model Coefficient
(N=42)	Intercept		189.54
.09	Able to implement plans	.0467	92.03
.10	More satisfied now than 5 years ago	.0366	-15.91
.07	Little influence over what happens	.0722	-48.25
.10	Lacks control over direction of life	.0239	39.55
.08	Anticipates being more satisfied	.0333	-32.33
BMI Reduction : Total			
(N=42)	Intercept		36.27
.09	Others unaware of importance of luck	.0467	-1.99
.12	Able to implement plans	.0166	16.34
.12	Responsible for own behavior	.0108	-7.16
.05	Controlled by luck	.1031	-4.97
.06	Lacks control over direction of life	.0634	3.53
.04	Anticipates being more satisified	.1031	-3.23
Duration of Treatment : Total			
	Intercept		23.00
.10	No such thing as luck	.0414	1.00
.11	Others unaware of importance of luck	.0232	0.85

Objective 7

The purpose of this objective was to determine whether the level of internal locus of control correlated with the length of time in the program and the total amount of weight reduction during that period.

Items A thru J in question 21 refer to internal as compared to external locus of control. Frequency distributions reported high levels of agreement on items that indicated internal locus of control. These included assuming responsibility for own actions, ranging from 92.5 to 95.1% in agreement, and ability to implement one's plans, increasing from 76.4% at baseline (N=106) to 93.3% in agreement at the final visit (N=45). High levels of disagreement were reported on items indicating external locus of control. These included not having enough control over direction of life, ranging from 66.3% at baseline to 78.3% at the final visit; belief that many things are controlled by luck, with disagreement consistently maintaining at 85% throughout the 25 weeks; and lack of influence over what happens to me, increasing from 74.5% at baseline to 84.8% in disagreement at the final visit (refer to Table 19).

Table 19: Locus of Control:
Adjustment During the Treatment Experience



Pearson's correlation coefficients were computed and although no significant correlations were indicated at baseline or final visit, a number of correlations were present in the postfast data. The postfast response total correlated positively with both weight and BMI reduction as well as to time spent in treatment (refer to Table 3).

A stepwise multiple regression analysis was conducted to assess the significance of various items within the question. Baseline data held a number of correlations. Belief that luck is unimportant was positively correlated with postfast weight and BMI reduction and total weeks spent in treatment. The response that most persons are unaware of control by accidental events was negatively correlated with weight reduction (refer to Table 20).

Table 20: Locus of Control:
Stepwise Regression Analysis of Baseline Responses Related to Weight and BMI Reduction

R^2	Factor	Significance Level	Model Coefficient
Weight Reduction : Fasting Phase			
(N=44)	Intercept		30.85
.13	Luck is unimportant	.0051	4.46
.12	Religious beliefs important	.0144	7.23
.07	Others unaware of importance of luck	.0414	-3.30
.04	Religious beliefs more important than 5 years ago	.1301	-3.39
Weight Reduction : Total			
(N=44)	Intercept		219.94
.11	Others unaware of importance of luck	.0287	-14.82
.08	Lack of control over direction of life	.0534	15.67
BMI Reduction : Fasting Phase			
(N=44)	Intercept		5.04
.13	Luck is unimportant	.0159	0.70
.11	Others unaware of importance of luck	.0186	-0.56
.08	Religious beliefs important	.0335	0.46
BMI Reduction : Total			
(N=44)	Intercept		48.07
.19	Others unaware of importance of luck	.0031	-2.57

At postfast data collection, belief that luck is unimportant again proved to be significant. This response showed positive correlation with both postfast weight and BMI reduction (refer to Table 21).

Responses at the final visit held a number of significant correlations. Belief that luck is unimportant, that luck is nonexistent, ability to implement one's plans, and lack of control over the direction of one's life were positively correlated with weight and BMI reduction. In addition, no such thing as luck, was positively correlated with total weeks spent in treatment. Two items showed negative correlations. The response describing most persons as unaware of control by accidental events was negatively correlated with total BMI reduction and weeks in treatment. Finally, responsibility for one's own actions was negatively correlated with total BMI reduction (refer to Tables 18 & 22).

Table 21: Locus of Control:
Stepwise Regression Analysis of Postfast Responses Related to Postfast Achievement

Weight Reduction : Fasting Phase			
R^2	Factor	Significance Level	Model Coefficient
(N=40)	Intercept		26.39
.17	Luck is unimportant	.0075	5.16
BMI Reduction : Fasting Phase			
(N=40)	Intercept		8.73
.19	Luck is unimportant	.0039	0.78
.05	Responsible for own behavior	.1323	-3.08
Duration of Treatment : Fasting Phase			
No variable met the 0.1500 significance level required for entry into the model			

Conclusion. Although it could be argued that obese persons have not exercised internal control, based on results of Pearson's correlations and stepwise multiple regression analysis, internal locus of control appears to be positively correlated with total time spent in treatment and amount of weight and BMI reduction. The person who has achieved a certain sense of control over themselves and events in his or her life, even if that has not resulted in weight

management in the past, and carries that sense of control into a treatment program has a greater potential for success in the program.

Table 22: Locus of Control and Life Satisfaction:
Stepwise Regression Analysis of Posttreatment Responses
Related to Posttreatment Achievement

Weight Reduction : Total			
R^2	Factor	Significance Level	Model Coefficient
(N=42)	Intercept		189.54
.09	Able to implement plans	.0467	92.03
.10	More satisfied now than 5 years ago	.0366	-15.91
.07	Little influence over what happens	.0722	-48.25
.10	Lacks control over direction of life	.0239	39.55
.08	Anticipates being more satisfied	.0333	-32.33
BMI Reduction : Total			
(N=42)	Intercept		36.27
.09	Others unaware of importance of luck	.0467	-1.99
.12	Able to implement plans	.0166	16.34
.12	Responsible for own behavior	.0108	-7.16
.05	Controlled by luck	.1031	-4.97
.06	Lacks control over direction of life	.0634	3.53
.04	Anticipates being more satisified	.1031	-3.23
Duration of Treatment : Total			
(N=42)	Intercept		23.00
.10	No such thing as luck	.0414	1.00
.11	Others unaware of importance of luck	.0232	0.85

Objective 8

The purpose of this objective was to determine whether the level of differential reinforcement for weight management differed between obese and nonobese persons.

As was explained earlier in describing the sample, on the basis of physiologic and demographic variables, the comparison group was not significantly different from the treatment group except in weight and BMI.

To evaluate this objective, responses to question 19, regarding reinforcing (rewarding) consequences, and question 20, regarding repressing (punishing) consequences, were compared with each other as well as with the responses of the treatment group. Descriptive statistics were initially calculated to determine mean and standard deviation (refer to Table 23).

Table 23: Differential Reinforcement:
Contrast of Treatment and Comparison Groups Utilizing Descriptive Statistics

Differential Reinforcement				
	Reinforcing Consequences		Repressing Consequences	
Group	Mean Total Response	Standard Deviation	Mean Total Response	Standard Deviation
Treatment	41.72	12.85	33.03	11.09
Comparison	43.04	10.97	35.74	13.12

Frequency distributions were calculated on an item by item basis. Minimal differences between the comparison and treatment groups were identified among the reinforcing consequences. However, 95.7% of the treatment group reported a sense of achievement with the accomplishment of weight loss while only 86.7% of the comparison group did so (refer to Table 24).

Greater differences between the obese and nonobese populations were identified among the repressing consequences. While 87.8% of the treatment group reported being embarrassed by failure when attempting to lose weight, only 68.2% of the comparison group did so. Utilizing a chi square test, this showed a significant difference between the two groups. Other significant differences were noted on the basis of impaired ability at work and being easily fatigued. However, on these items, the comparison group reported higher scores than the treatment group (refer to Table 24).

Table 24: Differential Reinforcement:
Contrast of Treatment and Comparison Groups Utilizing Chi Square Tests

Reinforcers					
Experience	Comp. Grp.		Trt. Grp.		P-Value
	%	N*	%	N*	
Compliments/family	91.67	48	83.44	99	.194
Sense of Achievement	86.67	45	95.70	93	.055
Repressers					
	%	N*	%	N*	
Teasing/friends	46.51	43	33.71	89	.155
Sabotage/family	46.15	39	33.72	86	.184
Embarrassed by failure	68.18	44	87.76	98	.005
Side Effects**	67.57	37	31.25	80	.0001
Easily fatigued	76.74	43	56.67	90	.025
Impaired ability at work**	44.44	36	23.29	73	.024
Decreased pleasure	60.47	43	41.86	86	.046

*Excluded missing data, not applicable and unknown responses

** Due to missing data, caution should be used in interpreting these results

In an effort to determine if an association existed between designated alternate consequences (reinforcing/repressing) as described in questions 19 and 20, a Kendall's Tau was performed. No discordant associations were found among the items listed in the responses of the comparison group. This was also true among responses from the treatment group. A battery of two sample t-tests was conducted to determine the significance of the difference between the two groups on the total score per category. Because multiple tests were conducted, it was necessary to adjust the acceptable level of significance $p<.001$ in order to minimize the overall significance level (Marks, 1982b). Neither the total mean response for reinforcing nor repressing consequences demonstrated a significant difference between the comparison group and the treatment group.

Conclusion. Although differences existed on specific indicators of response to reinforcing or repressing consequences within the questions, the findings of the Pearson's correlation and t-test indicate there is no significant difference between the two groups in response to differential reinforcement. However, the chi square tests conducted on an item by item basis noted some significant differences. Because the questions related specifically to weight management experiences which may have been irrelevant for the some members of the comparison group, overall results from this section are of questionable relevance.

Objective 9

The purpose of this objective was to determine whether the perception (attitudes and definition) of obesity differed between obese and nonobese persons.

Descriptive statistics, based on mean total response, revealed that the treatment group had a more negative attitude toward obesity than the comparison group (refer to Table 25). Frequency distributions further emphasized this finding (refer to Tables 26).

Table 25 : Attitudes Toward Obesity:
Contrast of Treatment and Comparison Groups Utilizing Descriptive Statistics

Attitudes Toward Obesity			
Group	Mean Total Response	Standard Deviation	Range
Treatment	62.60	16.16	20-92
Comparison	54.79	16.94	22-86

Question 15 asked the respondent to describe the attitudes, not only of themselves but of family and close associates. A two sample t-test was conducted to compare the mean total response to questions dealing with attitude toward (or definition of) obesity and found that there was no significant difference between the responses of the comparison and treatment groups.

Conclusion. On the basis of Pearson's correlation, two sample t-test, and stepwise multiple regression analysis, it can be assumed that there is no significant difference in the

attitude toward or definition of obesity in obese and nonobese populations. However, the frequency distribution showed a more negative attitude toward obesity among the obese and the chi square test indicated a significant difference between the two groups on this finding.

Table 26: Attitudes Toward Obesity:
Contrast of Treatment and Comparison Groups Utilizing Chi Square Tests

Percent of Respondents Reporting Negative Attitudes Toward Obesity					
Family	Comp. Grp.		Trt. Grp.		P-Value
	%	N*	%	N*	
Self	33.33	51	61.17	103	.001
Spouse/Significant Other	57.50	40	44.05	84	.161
Daughter(s)**	63.64	22	37.50	48	.042
Sons(s)**	54.17	24	38.98	59	.206
Mother	30.56	36	27.06	85	.696
Father**	33.33	30	33.87	62	.959
Grandmother(s)**	26.92	26	13.33	30	.202
Grandfather(s)**	33.33	21	11.11	18	.101
Sister(s)**	32.35	34	43.10	58	.308
Brother(s)**	35.48	31	44.44	54	.419
Friends					
Female friends	36.96	46	34.38	96	.763
Male friends	48.84	43	39.56	91	.311
Others					
Female coworkers	53.13	32	44.32	88	.392
Male coworkers	46.67	30	42.31	78	.682
Female acquaintances	39.02	41	35.37	82	.691
Male acquaintances	43.24	37	37.80	82	.574

* Excluded missing data, not applicable, and unknown responses.

** Due to missing data, caution should be used in interpreting these results

Objective 10

The purpose of this objective was to determine whether the degree of association with obese persons differed between obese and nonobese persons.

Participants were asked to categorize the majority of their acquaintances in one of three categories, underweight, average weight, or overweight. In the frequency distributions, it was reported that 81.9% of the treatment group and 86.8% of the control group described the majority of their acquaintances as average weight.

Respondents were asked to estimate the number of obese individuals in categories including family, friends, and others. A two sample t-test was performed and showed a negative correlation between the mean total responses of the two groups (refer to Table 27).

Primary group associations accounted for a greater difference between the two groups. Table 28 shows that the greater differences between the obese and nonobese groups were related to family and friends rather than to acquaintances or coworkers. Those in the treatment group were more likely than the comparison group to have overweight spouses, parents, grandparents, and siblings.

Conclusion. The chi square test and the two sample t-test indicate a significant difference between the comparison and treatment group. As anticipated, this difference was based on differential association in primary groups rather than general association.

Table 27: Overweight Family Members and Associates:
Contrast of Treatment and Comparison Groups Utilizing Two Sample T-Tests

	Comparison Group	Treatment Group
N	53	106
Mean	363.62	543.07
Standard Deviation	344.03	331.52
Standard Error	47.26	32.20
Minimum	0	0
Maximum	1881	1584
Variances		Equal
Prob>|T|		0.002

Objective 11

The purpose of this objective was to determine whether the similarity of current eating behaviors and attitudes toward food to those of the childhood home differed between obese and nonobese persons.

Items included in Question 17 were separated into environmental and behavioral categories. Frequency distributions were calculated and chi square tests were performed. For the environmental category, there is little difference in the similarity between childhood and

Table 28: Overweight Family Members and Associates:
Contrast of Treatment and Comparison Groups Utilizing Chi Square Tests

Percent of Respondents with Overweight Family and Associates					
Family	Comp. Grp.		Trt. Grp.		P-Value
	%	N*	%	N*	
Spouse/Significant Other	41.46	41	54.76	84	.163
Daughter(s)	14.29	28	42.31	52	.011
Sons(s)	20.00	35	32.76	58	.184
Mother	54.35	46	62.00	100	.381
Father	34.78	46	53.19	94	.040
Grandmother(s)	57.78	45	74.07	81	.060
Grandfather(s)	21.95	41	39.06	64	.068
Sister(s)	40.54	37	63.16	76	.023
Brother(s)	36.84	38	47.30	74	.291
Friends					
Female friends	71.15	52	75.00	96	.612
Male friends	44.44	45	64.29	84	.030
Others					
Female coworkers	64.86	37	79.76	84	.080
Male coworkers	46.88	32	61.04	77	.174
Female acquaintances	83.67	49	83.33	72	.961
Male acquaintances	69.77	43	68.92	74	.924
Majority of acquanintances	13.21	53	16.21	103	.499

* Excluded missing data, not applicable, and unknown responses.

adult patterns regarding more or less "neutral" items such as cooking methods and skills. For food preferences, however, which can be expected to affect weight gain, 54.7% of the comparison group reported a high degree of similarity to the family of origin while only 35% of the treatment group did so. There is no measure of what these preferences are but the assumption is that the average weight adult preferred less fattening food.

Several of the behavioral items differentiated between the comparison and treatment groups. Of those in the treatment group, 29.7% reported using food as a reward while only 6.82% of the comparison group did so. Emphasis on cleaning one's plate and snacking behaviors also revealed higher response scores among the treatment group than the comparison group. Encouraging second helpings, rapid rate of eating, and withholding food as a punishment were all more characteristic of the obese group than the comparison group (refer to Table 29).

Table 29:
Resemblance of Current Behaviors and Attitudes Toward Food to those of Childhood Home: Contrast of Treatment and Comparison Groups Utilizing Chi Square Test

Percent of Respondents Reporting a High Degree of Similarity					
Environmental	Comp. Grp.		Trt. Grp.		P-Value
	%	N*	%	N*	
Cooking methods	39.62	53	33.02	106	.200
Cooking skills	35.85	53	26.21	103	.323
Food preferences	54.72	53	34.95	103	.060
Social eating	41.51	53	48.51	101	.666
Behavioral					
Food used as reward	6.82	44	29.67	91	.008
Food withheld as punishment**	2.94	34	8.64	81	.256
Clean plates stressed	25.53	47	40.21	97	.054
Snacking behaviors	19.23	52	33.01	103	.088
Rapid rate of eating	22.00	50	33.33	96	.262
Second helpings encouraged	19.23	52	32.65	98	.134

* Excluded missing data, not applicable, and unknown responses.

** Due to missing data, caution should be used in interpreting these results

Conclusion. Although specific items indicated a significant difference between the comparison and the treatment groups, the results of the Pearson's correlation and two sample t-test did not confirm these findings on the mean total response. However, findings did identify specific behaviors related to family background that may contribute to the development of obesity.

Objective 12

The purpose of this objective was to determine whether perceived success in achieving life's goals differed between obese and nonobese persons.

Descriptive statistics presented a summary of question 18, based on educational, occupational, and personal goal achievement. The mean total response was only one point higher for the comparison group (10.11) than for the treatment group (9.16).

Frequency distribution showed a consistently higher sense of achievement among the comparison group. Chi square tests were performed and the difference was significant for both educational and personal goal achievement (refer to Table 30).

Table 30: Goal Achievement:
Contrast of Treatment and Comparison Groups Utilizing Chi Square Tests

Percent of Respondents Reporting Goal Achievement					
Environmental	Comp. Grp.		Trt. Grp.		P-Value
	%	N*	%	N*	
Educational	64.71	51	45.28	106	.053
Personal	52.83	53	35.85	106	.003
Occupational	69.23	52	55.77	104	.168

The two sample t-test comparing responses of the comparison group and the treatment group showed a positive correlation between the two groups, $p<.0092$. However, due to the adjustment of the acceptable significance level based on multiple statistical tests ($p<.001$), this result is of questionable significance.

Conclusion. Based on the questionable positive correlation reported on the two sample t-test, it cannot be assumed that perceived goal achievement differentiates between obese and nonobese individuals. However, on the basis on frequency distributions and the results of the chi square tests, further study is indicated.

Objective 13

The purpose of this objective was to determine whether the level of life satisfaction differed between obese and nonobese persons.

Frequency distribution indicates that the percentage of persons reporting current life satisfaction and life satisfaction greater than in the past was significantly higher among the comparison group. Although a greater percentage of the treatment group (90.4%) than the comparison group (82%) anticipated being more satisfied in the future, a significant difference between the two groups was not present in this category (refer to Table 31).

Table 31: Life Satisfaction
Contrast of Treatment and Comparison Groups Utilizing Chi Square Tests

Percent of Respondents Reporting Satisfaction with Life					
Environmental	Comp. Grp.		Trt. Grp.		P-Value
	%	N*	%	N*	
Satisfied with life now	73.08	52	42.86	105	.0001
More satisfied than 5 years ago	80.39	51	56.19	105	.0040
Anticipates being more satisfied	82.00	50	89.52	105	.2170

Conclusion. The frequency distribution and the results of the chi square test indicate a significant difference between the two groups on the basis of current life satisfaction.

Objective 14

The purpose of this objective was to determine whether perceived level of internal locus of control differed between obese and nonobese persons.

Internal versus external locus of control was assessed in question 21, items A through J. The mean total response for the control group was 35.43 with a standard deviation of 5.89 in a

range from 2 to 45. The mean total response for the treatment group was 36.93 with a standard deviation of 3.83 in a range from 20 to 44.

Frequency distribution showed consistently similar percentage of positive response to those items indicating internal locus of control. One item, lack of control over direction of life, indicating external locus of control, was significantly higher among the members of the treatment group (refer to Table 32). However, the two sample t-test conducted to compare the mean total response of the treatment and comparison group showed no statistically significant difference.

Conclusion. Based on the lack of significant correlation reported by the two sample t-test, as well as the minimal differences noted in stepwise multiple regression and the frequency distribution, internal locus of control does not appear to differentiate between obese and nonobese persons.

Table 32: Locus of Control:
Contrast of Treatment and Comparison Groups Utilizing Chi Square Tests

Percent of Respondents in Agreement with Internal Locus of Control					
Environmental	Comp. Grp.		Trt. Grp.		P-Value
	%	N*	%	N*	
Responsible for own self	100.00	53	92.45	106	.1220
Ability to implement plans	70.59	51	77.14	105	.6080
No such thing as luck	26.00	50	23.80	103	.6030
Chance/luck is unimportant	28.57	49	29.70	101	.7830
Percent of Respondents in Agreement with External Locus of Control					
Lacks control over life	6.00	50	21.36	103	.0430
Many things due to luck	5.77	52	6.67	105	.9510
People unaware of importance of accidents	46.00	50	37.50	96	.2970
Lack influence over what happens	9.62	52	14.44	105	.3970

Summary

The questionnaire was administered at the beginning of the program, one week prior to the conclusion of the fasting segment and one week prior to the conclusion of the program. Of the original 106 participants, 81 completed postfast questionnaires and 45 completed the final questionnaire. The initial weight of all subjects ranged from 154 to 448 pounds with a mean of 233.5. Initial BMI ranged from 27.57 to 63.23 with a mean of 36.69.

Among those completing the program, the initial weight ranged from 168.5 to 373 pounds with a mean of 234.5, and the final weights ranged from 135 to 307.5 pounds with a mean of 185.5. The initial BMI of those individuals completing the program ranged from 27.57 to 52.67 with a mean of 37.3 and the concluding BMIs ranged from 22.79 to 45.98 with a mean of 29.07. This would indicate that beginning weight and BMI had little influence on the level of adherence to the program (refer to Table 33).

Table 33: Response Variables:
Descriptive Statistics for Total Treatment Groups Related to Outcome

Label	N	Min.	Max.	Mean	Std. Dev.
Initial Weight	106	154.00	448.00	233.45	50.64
Height	106	58.00	74.00	66.19	3.39
Initial Body Mass Index	106	27.57	63.23	36.69	6.60
Initial Weeks in Treatment	104	0	12.00	10.08	3.46
Postfast Weight	103	132.00	367.00	199.64	44.46
Postfast BMI	103	23.40	55.39	31.33	5.89
Postfast Weight Reduction	103	-1.00	84.50	22.82	17.90
Postfast BMI Reduction	103	-0.17	11.43	5.29	2.63
Total Weeks in Treatment	105	0	25.00	16.96	8.43
Final Recorded Weight	105	132.00	350.75	194.41	43.74
Final Body Mass Index	105	22.79	54.35	30.54	5.90
Total Weight Reduction	105	-1.00	109.00	38.90	23.49
Total BMI Reduction	105	-0.17	14.53	6.09	3.49

CHAPTER V
DISCUSSION

The primary purpose of this study was to examine the environmental and behavioral factors influencing weight management in a PSMF-BMC among medically at risk obese adults from the perspectives of social learning theory (Akers, 1985, 1987, in press) and strain theory (Merton, 1968). Viewing obesity as a type of deviant behavior, the environmental and behavioral factors were considered from the perspective of preexisting personal traits which might influence success as well as from the perspective of treatment interventions . Based on social learning theory according to Akers (1985, 1987), it was expected that differential association and differential reinforcement would be correlated with the duration of adherence to a weight management program and to the amount of weight reduction achieved. From the aspect of strain theory according to Merton (1968) it was expected that life satisfaction, goal achievement, and internal locus of control would be correlated with duration of treatment and amount of weight reduction.

While the majority of previous studies of adherence in a PSMF-BMC focus on the program format as related to outcome (Brownell, Marlatt, Lichenstein, & Wilson, 1986; Matz, 1987; Stallonas & Kirshenbaum, 1985; Stunkard, 1984; Wadden & Stunkard, 1986; Wadden, Stunkard & Brownell, 1983), this study considered weight management from the aspect of patient behaviors and patient perceptions. Other studies have addressed issues of adherence to exercise programs (Gillett, 1988) and a variety of weight management programs for high risk adults (White, 1984) but not specifically the PSMF-BMC.

A secondary purpose of the study was to determine if obese individuals differed significantly from the nonobese population in ways other than weight. This comparison was

intended to clarify some of the factors leading to obesity which cannot be accomplished with only an obese group. It was expected that certain familial and behavioral traits would differentiate between the two groups.

A study of participants in a weight management program for the medically at risk obese can reveal only differences among those in that program. Because participants are all somewhat similar, at least in being obese, only limited knowledge could be gained by examining differences within this group. Attempting to account for variations in behaviors related to obesity in such a group is difficult since all of the variation lies at the extreme end of the weight scale. In order to learn more about the behavior of this group, beyond success or lack of success in the program, comparisons with person in the middle and lower end of the weight scale were needed.

This chapter contains a discussion of the research results, the limitations of the study, the conclusions, and recommendations for future research on factors influencing level of adherence in PSMF-BMC programs.

Relevance of Findings

The demographic description of the participants in the study varied somewhat from the national norms with males constituting approximately 20% rather than the typical 10% male population in a treatment group. Age ranged from 21 to 66 years which is typical of the usual treatment population. BMI ranged from 27.57 to 63.23 which is higher than most nonmedical weight management programs but representative of those designed for the morbidly obese a minimum of (50 pounds overweight or 30% over ideal body weight).

Differential Reinforcement

As expected theoretically, differential reinforcement, the balance of reinforcing (rewarding) and repressing (punishing) consequences related to treatment, was a significant factor relating to continuation in the program and weight reduction. This relationship was based on experiences while in the program rather than individual expectations or background

traits. Those participants who found more reinforcing than repressing outcomes were more likely to continue in the program and achieve greater weight reduction.

Specific variables had significant correlation with the level of postfast and total weight reduction. The importance of decreased need for medication as a reinforcer for success in the program related to the fact that the program is for medically at risk individuals. Two negative expectations, fatigue and being sabotaged by friends, proved to be predictors of a smaller weight and BMI reduction.

In the postfast data collection, responses identifying reinforcing consequences were highly correlated with the postfast weight and BMI reductions and duration of treatment. Three categories of factors were identified that were of significance in relation to adherence during the fasting portion of the program. These included family support, personal achievement, and behavioral changes, thus indicating a tripod effect consisting of patient, family, and therapist interaction for maximal therapeutic outcomes. It is noteworthy that nagging by family was correlated with less weight and BMI reduction, emphasizing the need for mutual understanding between patient and family about where support ends and nagging begins.

Several factors had varying influence depending on the stage of the program. During the fasting segment, guilt feelings related to cheating contributed to increased weight reduction, indicating that the guilt was a motivater to avoid cheating. In contrast, during the final half of the program, guilt after cheating resulted in less weight reduction. Although this may relate to the fact that solid food has been reintroduced into the diet and the temptation to cheat is greater, this finding has clinical ramifications for timing interventions. During the latter segment of the program, assisting the patient to assess behaviors and consider alternatives will be more effective than reinforcing the guilt which they inherently experience.

Decreased preoccupation with food was a significant factor for success during the fast. In contrast, cravings for food correlated with less BMI reduction during the final phase. These

findings indicate that the level of direction and support provided the client will need different emphasis during the various stages of the program. The limited choices available during the fast facilitate adherence while the challenge of selection and increased personal responsibility during the realimentation phase require a different level of support and guidance. This finding relates closely to the guilt evoking experiences discussed in the previous paragraph.

Differential social reinforcement from friends was important in relation to duration of treatment. Encouragement from friends was positively correlated with duration of treatment. Teasing and being sabotaged by friends and less contact with old friends were factors that correlated with less time in treatment and decreased weight reduction.

Being embarrassed by failure is a highly significant factor in reducing the amount of time spent in treatment. This has important therapeutic implications. Failure is a negative experience and the therapist should frame such experiences in a positive manner, as opportunities for reassessment and self-understanding rather than reinforcing the self-recrimination experienced by the patient.

Differential reinforcement proved to be a significant factor in the treatment of medically at risk obese adults. However, the differentiation became more clearly established as the program progressed and would not be an effective pretreatment method of differentiating between potentially successful and unsuccessful candidates. Instead, it provides insight for the therapist directing the treatment program. The importance of an appropriate support system during the treatment experience was noteworthy.

Attitude Toward Obesity

While this factor did not predict level of achievement in the program, it proved to be more relevant in differentiating obese and nonobese population. Among treatment group subjects, nearly two-thirds reported a negative attitude toward obesity while only one-third of the comparison group did so. Participants were also asked to describe attitudes toward obesity held by their family, friends, and society in general. Only the attitudes of females in general

were correlated with weight or BMI reduction. This emphasizes the importance of societal norms and values, validating the importance of sociological as well as the psychological and physiological ramifications of the illness. In spite of the fact that the majority of obese individuals have a negative attitude toward obesity, that attitude has little impact on the duration of adherence to a weight loss program or the amount of weight reduction.

Differential Association

Over 80% of the respondents stated that the majority of their friends were of average weight. However, 46.4% reported their spouse was overweight, 60.2% reported an overweight mother, 49% an overweight father and 58.3% an overweight grandmother. These percentages were significantly different from those reported by the nonobese comparison group. The incidence of an overweight mother, grandmother, and female friends showed significant correlation with level of postfast weight reduction. The consistent inclusion of family members may be indicative of the influence of genetics (Stunkard, 1986) as well as social factors, while the significance of spouses weight and other primary groups besides the family argues for the primacy of social factors (Akers, 1985).

Behaviors and Attitudes Toward Food

The identification of specific eating behaviors related to specific stages of the treatment program demonstrated in this category have clinical and therapeutic significance. Those who report ongoing emphasis on cooking skills showed significant correlation with increased duration of treatment and amount of weight and BMI reduction during the fasting portion of the program. However, this behavior was not significant in total weight reduction. This implies that for those who emphasize cooking, the fasting portion of the program offers fewer problems because cooking is not a requirement during this segment of the treatment program.

In contrast, those who reported a high similarity of snacking behavior to those of the childhood home showed a significant correlation with decreased duration of treatment and decreased weight and BMI reduction during the fasting portion of the program. For those with

long established snacking habits, the challenge of adhering to a fast appears to be much greater. Therapists should be attuned to this type of problem and in prescreening assessments determine what kinds of problems might be predicted based on the eating history of the client. Not only can this alert the therapist to potential problem areas, it can be used as a teaching intervention to facilitate patient self-awareness.

Rapid rate of eating proved to be a significant factor during the latter portion of the treatment program. This behavior showed a significant correlation with decreased weight and BMI reduction. The emphasis on behavior change should be continued throughout the program. The preexisting behavior pattern, reinforced by the simplicity of consuming five liquid feedings per day during the supplemented fast, requires ongoing monitoring and increasing self-awareness if the patterns are to be overcome.

These findings have obvious treatment implications. However, they also imply that genetics alone do not determine the level of success in a weight management program. Specific behaviors are learned and not inherited. Therefore, appropriateness of the behavioral treatment modality is reaffirmed by these findings.

Life Satisfaction

Frequency distributions revealed a progressive level of life satisfaction at subsequent data collections. However, being satisfied with life as it is and anticipating being more satisfied with life in the future were negatively correlated with total BMI reduction according to step wise multiple regression. These findings imply that when participants reach the level of weight loss that satisfies them, they no longer seek further weight reduction. Since this variable did not correlate with duration of treatment, it does not imply that treatment is necessarily terminated when this occurs. Once again, this has implications for the patient/therapist relationship. The importance of mutually acceptable goal setting is essential. These findings may also relate to the fact that patients enter the program with varying degrees of obesity and the degree of weight loss reported may indeed be based on ideal weight.

Locus of Control

Lack of reliance on luck proved to be a significant factor, showing a positive correlation with total duration of treatment and total weight reduction. Confidence in one's ability to successfully implement plans showed positive correlation with total weight reduction at the final data collection. Concern about lack of control over the direction of one's life was positively correlated with total weight reduction. Since lack of control is a frequent theme among obese individuals, this awareness may serve as a motivating factor in the weight management process (Rodin, Schank, & Striegel-Moore, 1989).

Although 90% of the respondents at each of the three data collections expressed belief that individuals are responsible for their own actions, this factor was negatively correlated with total BMI reduction according to the final survey. The program emphasizes self-direction and individual responsibility but, because of the highly structured format, those who are willing to relinquish control and dietary decisions, may have greater weight reduction during the realimentation and stabilization phases of the program. While this is of short term advantage, the long term implications may be negative. This reaffirms the need for support groups following completion of the 26-week program (Brownell, Marlatt, Lichtenstein, & Wilson, 1986).

Overall, internal locus of control is a positive factor in long term weight reduction. It is of even greater importance in maintaining that weight reduction. Therefore, the therapist should foster this quality in the participants and encourage priority setting, problem solving, and decision making skills.

Differences Between Treatment Group and Comparison Group

Because of the shared condition of chronic morbid obesity, it was assumed that the treatment program participants would share similar attitudes and experiences. Therefore, the need to determine if there was a significant difference between obese and nonobese populations was presented. Not surprisingly, the persons in treatment for obesity did not have many differences among them in background associates, attitudes, or experiences.

The two groups differ on the number of obese family members and associates (differential association) and in resemblance of behaviors and attitudes relating to food to those of childhood home (modeling and differential reinforcement). In the treatment group, the existence of an obese father, mother, and grandmother was positively correlated with a greater weight and BMI. However, this did not occur in the comparison group. These findings reaffirm the genetic basis for obese and nonobese populations (Stunkard et al., 1986) but the influence of primary reference groups must be acknowledged (Akers, 1985). These findings indicate a noteworthy difference between the two groups.

The two sample t-test showed correlation of questionable significance between the two groups on the basis of goal achievement. Frequency distributions showed a consistently higher sense of achievement in the comparison group. This proved to be significant in the areas of educational and personal goal achievement.

Life satisfaction, possibly related to level of goal achievement, also proved to be a significant difference between the treatment and comparison group according to the frequency distribution. The level of greater life satisfaction was slightly higher than the comparison group, probably due to their anticipated weight loss. Locus of control proved to be of significance in the treatment group, and it did not differentiate the control group from the treatment group. This did not confirm previous studies (Mahoney, 1975; Warner & Balgura, 1975).

Appropriateness of Questionnaire Content

On the basis of content validity and the evidence that the questionnaire showed significant correlation with duration of treatment and weight and BMI reduction, the appropriateness of the content has been validated. However, experience in using the questionnaire has established certain alterations that would improve the overall format. Questions relating to reinforcing and repressing behaviors as well as those addressing obesity among family and close associates are most appropriate. Others that have significance include

those assessing locus of control and similarity of current eating behaviors to those of the childhood home. Questions that showed no significance may ultimately be eliminated but reformatting and abbreviation of the questions and repeated use prior to deletion would seem appropriate.

Although it is not the primary purpose of the questionnaire, certain items do predict success or the effectiveness of the treatment program. It is also useful as a method of assessing therapeutic interventions and patient responses. As a tool to assist in understanding the internal dynamics which either facilitate or interfere with the treatment outcome, it provides insights to both patient and therapist which will facilitate coping with specific problem periods in the treatment process.

Limitations

Conclusions about the results of this study should be considered according to certain limitations. As is the case with behavioral research in general, this study has limits of internal validity. The length of the questionnaire and the format of questions related to association with obese persons and attitudes toward obesity and very low calorie diets proved to be limitations.

The limitation of ability to generalize results due to the dropout rate must be recognized. Since one of the response variables was duration of treatment, dropout rate was an important factor. Factors influencing dropout varied from personal or family illness to financial pressures. This was further complicated by the fact that most of the groups were in treatment over two major holidays with accelerated dropout levels during those periods. A final factor related to a change in insurance coverage by a major carrier during the time of the survey. This undoubtedly increased attrition rates.

Although mail out surveys were sent to those who had left the program, the response level was low, even with follow up. Therefore, the input of those who left the program was essentially missing. The question of differences in significance from one data collection to the

next may have been related to the treatment experience or it may have been simply because people with certain perceptions stayed in the program. However, in spite of this limitation, the information has valid clinical implications.

Variation in treatment intervention might be considered to be a limitation. Because groups surveyed were in different locations (four) and led by different behaviorists (seven), individual differences in presentation were inevitable in spite of a standardized format and treatment regimen. These differences may have influenced the perceptions and responses of the participants. The fact that the researcher was a behaviorist in two of the groups might have further biased the responses. However, the variety of geographic locales and therapists may also be considered a strength in that it provided a broader response base upon which to generalize results.

Conclusions

Although additional comparison studies are recommended, findings in this study indicate that understanding obesity as a mild form of deviant behavior is appropriate. In addition, the treatment of obesity in a systematic program benefits from a sociological as well as a psychological and physiological perspective. Social learning theory and locus of control were found to be relevant in these patients. Further study utilizing these frameworks (Akers, 1985; Bandura, 1977b, 1982; Rodin, 1978;) is indicated.

It can be concluded that differential reinforcement is a significant factor in facilitating adherence to a PSMF-BMC and the significance of specific factors may vary according to the stage of treatment. These findings are of value in formulating preentry behavioral assessments and in timing therapeutic interventions. In addition, important factors involve not only the patient and the therapist but also the patient's family.

Previous studies on exercise adherence (Gillett, 1988) and an assessment of attrition in weight reduction program (White, 1984) have also recognized the importance of group support

and patient perception. The results of this study indicated group support was reported as important by 78.7% and support from the group leader was important to 79% of the patients during the fasting segment, and 78.3% and 82%, respectively, during the final phase of the program. However, neither group support or support from the group leader proved to be significant in determining the level of achievement in the program. Personal achievement and the support of family and friends were the significant factors in this study.

Financial pressure which was expected to be a repressing factor among patients in a long term, medically managed program, instead correlated with long term success. This may be interpreted that those patients were subjected to more financial demands because of the length of time spent in the program. However, it may also be based on the importance of financial investment as well as time and effort in the overall commitment to a lifestyle change.

Recommendations for Further Study

The questionnaire needs alteration and clarification on the matter of obese family members, friends, and associates. These data are valuable but the question needs to be formatted more specifically. Similar adjustments are needed in the segments on attitudes toward obesity and very low calorie diets. The scope needs to be narrowed and directions abbreviated. Following these adjustments, the questionnaire needs additional utilization to further insure its validity and reliability.

If social learning theory is to be studied further in relation to obesity, a much larger sample comparing obese and nonobese populations is needed. A large (1000 subject) sampling of a normal population, including height and weight, should be obtained and this group divided into nonobese and obese at or exceeding (30% or 50 pounds over ideal body weight) and responses of nonobese and obese subjects compared. Then these responses could be compared with a much larger sample of individuals in a PSMF-BMC.

Specific questions in the initial questionnaire would need to be reformatted although the basic content is appropriate in the comparison of obese and nonobese populations. For example, a general question was phrased in terms of similarity of current eating behaviors to those in childhood home, and is less able, therefore, to capture the differences in childhood eating socialization between obese and nonobese persons. In the revised format, the subject would be asked to identify which of the behaviors existed in their family and then to state whether or not that behavior was practiced in their family today using simple yes and no responses. In the questions related to differential reinforcement, the experiences should be evaluated in terms of motivation for weight management rather than in relation to a weight reduction program.

Although locus of control, life satisfaction, and goal achievement did show some significance in this study, much broader research is needed if strain theory is to be adequately evaluated as a theoretical framework for the condition of obesity. This seems to have more sociological than nursing implications. Merton's theory provides fewer clinical implications for therapeutic intervention.

The material regarding snacking behaviors, cooking skills, and rate of eating as related to difficulties experienced in specific stages of treatment provide excellent opportunity for clinicians in the treatment setting. Assessment of specific attitudes and behaviors could be included as a segment in the prescreening evaluation. Additional support could be provided at critical periods on the basis of findings. Dropout rates could be tracked. The technique could be used in one-half of the groups in progress and the dropout rates in the two groups on the basis of such information could be compared. Such studies would require minimal expense but could serve to validate research findings as well as reduce patient attrition.

In summary, in this study it was found that the balance of reinforcing and repressing consequences experienced by clients in a long term weight management program will significantly influence the length of time they remain in the program and the amount of weight reduction achieved. In addition, specific behavioral traits and attitudes related to food and

eating will predict which segment of the program will be most difficult and require additional support and direction. These attitudes and behaviors have frequently been learned and practiced since childhood. If the behaviors are to be recognized and altered, the nurse therapist must interact with both the personal and social systems of the client in order to facilitate attainment of the mutually established goals (King, 1981).

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APPENDIX A
WEIGHT MANAGEMENT QUESTIONNAIRE

Weight Management Questionnaire

ID# __ __ __ __ __ __ __ Today's date __ __-__ __-__ __ Site: __ __

1. Date of Birth: (month, date, year) __ __ -__ __ -__ __

2. Sex: ___ (M) or ___ (F)

3. Age when you first experienced weight control problems __ __ YRS

4. Age when you first entered a weight loss program (if applicable) __ __ YRS

5. What is your current weight in pounds?
(example: 200.5 for 200 & 1/2) ___ ___ ___-___ ___

6. What is your current height in inches?
(example: 63.75 for 5 ft 3 & 3/4") ___ ___-___ ___

7. Marital status: ___ never married (1) ___ married (2) ___ divorced (3)

___ separated (4) ___ widowed (5)

8. Number of children living at home __ __

9. Last or highest year completed in school ___ ___

10. Employment status of respondent (check appropriate category):

___ Full time (1) ___ Part time (2) ___Homemaker (3)

___ Disabled (4) ___ Retired (5) ___ Unemployed (6)

11. Employment status of spouse (if applicable):

___ Full time (1) ___ Part time (2) ___Homemaker (3)

___ Disabled (4) ___ Retired (5) ___ Unemployed (6)

___ Not applicable (0)

12. Motivation for entering this weight loss program (check <u>one</u> best response)

___ Pressure from others (non-medical) (1) ___ Medical referral (2)

___ Cosmetic reasons (3) ___ Health reasons (4)

13. Using <u>one</u> of the categories listed below, please describe the majority of people you spend time with or do things with (family, friends, or acquaintances).

___ Underweight (1) ___ Average Weight (2) ___ Overweight (3)

ID# __ __ __ __ __ __ __ __ Today's Date __ __-__ __-__ __ Site: __ __

14. In this question, we are attempting to identify the number of overweight persons who are or have been important in your life. Please write in the blanks provided the approximate number of persons in each of the categories who are or have been at least 20 pounds overweight at some time (other than pregnancy) during your association with them. (Please note: UNKNOWN = UK; NOT APPLICABLE = NA). For example, write 0 if neither parent was overweight; circle NA, if you had no brothers or sisters; circle UK if you do not know your grandparents weight.

Spouse or significant other	___ ___	UK	NA
Daughter(s)	___ ___	UK	NA
Son(s)	___ ___	UK	NA
Mother (natural)	___ ___	UK	NA
Mother (adoptive/step)	___ ___	UK	NA
Father (natural)	___ ___	UK	NA
Father (adoptive/step)	___ ___	UK	NA
Grandmother(s)	___ ___	UK	NA
Grandfather(s)	___ ___	UK	NA
Sister(s)	___ ___	UK	NA
Brother(s)	___ ___	UK	NA
Females in the following categories:			
Close friends	___ ___	UK	NA
Coworkers	___ ___	UK	NA
Acquaintances	___ ___	UK	NA
Persons I admire	___ ___	UK	NA
Persons I'd like to have as a friend	___ ___	UK	NA
Males in the following categories:			
Close friends	___ ___	UK	NA
Coworkers	___ ___	UK	NA
Acquaintances	___ ___	UK	NA
Persons I admire	___ ___	UK	NA
Persons I'd like to have as a friend	___ ___	UK	NA

ID# __ __ __ __ __ __ __ Today's Date __ __-__ __-__ __ Site: __ __

15. In this question, we are attempting to determine the attitude of you and your associates toward obesity. Starting with your own attitude, please CIRCLE the number in the column that most accurately describes the one most characteristic attitude of each person or group of persons listed below: (Please note: UNKNOWN = UK; NOT APPLICABLE = NA)

	Negative	Neutral	Empathetic	Positive	UK	NA
Yourself	5	4	3	2	1	0
Spouse/Significant other	5	4	3	2	1	0
Daughter(s)	5	4	3	2	1	0
Son(s)	5	4	3	2	1	0
Mother	5	4	3	2	1	0
Father	5	4	3	2	1	0
Grandmother	5	4	3	2	1	0
Grandfather	5	4	3	2	1	0
Sister(s)	5	4	3	2	1	0
Brother(s)	5	4	3	2	1	0
Females in the following categories:						
Most friends	5	4	3	2	1	0
Most coworkers	5	4	3	2	1	0
Most acquaintances	5	4	3	2	1	0
Females I admire	5	4	3	2	1	0
Females in general	5	4	3	2	1	0
Males in the following categories:						
Most friends	5	4	3	2	1	0
Most coworkers	5	4	3	2	1	0
Most acquaintances	5	4	3	2	1	0
Males I admire	5	4	3	2	1	0
Males in general	5	4	3	2	1	0

ID# __ __ __ __ __ __ __ Today's date __ __-__ __-__ __ Site: __ __

16. In this question we are attempting to identify attitudes toward very low calorie diets (less than 500 calories per day). Starting with your own attitude, please circle the number in the column that most accurately describes the one most characteristic attitude of each person or group of persons listed below. (Please note: UNKNOWN = UK; NOT APPLICABLE = NA).

	Positive	Neutral	Critical	UK	NA
Yourself	4	3	2	1	0
Spouse\Significant other	4	3	2	1	0
Daughter(s)	4	3	2	1	0
Son(s)	4	3	2	1	0
Mother	4	3	2	1	0
Father	4	3	2	1	0
Grandmother	4	3	2	1	0
Grandfather	4	3	2	1	0
Sister(s)	4	3	2	1	0
Brother(s)	4	3	2	1	0
Females in the following categories:					
Most friends	4	3	2	1	0
Most coworkers	4	3	2	1	0
Most acquaintances	4	3	2	1	0
Females I admire	4	3	2	1	0
Females in general	4	3	2	1	0
Males in the following categories:					
Most friends	4	3	2	1	0
Most coworkers	4	3	2	1	0
Most acquaintances	4	3	2	1	0
Males I admire	4	3	2	1	0
Males in general	4	3	2	1	0

ID# __ __ __ __ __ __ __ Today's date __ __-__ __-__ __ Site: __ __

17. In this question, we are attempting to determine if an adult's attitudes and behaviors relating to food and eating are similar to those observed in the childhood home. Please circle the number in the column that most accurately describes how much your current personal behaviors in each area resembles what you experienced in the home in which you grew up. (Please note: UNKNOWN = UK; NOT APPLICABLE = NA).

	Very Much	Somewhat	Not at all	UK	NA
Methods of cooking	4	3	2	1	0
Emphasis on cooking skills	4	3	2	1	0
Eating as a social event	4	3	2	1	0
Food withheld as punishment	4	3	2	1	0
Food preferences	4	3	2	1	0
Food used as a reward	4	3	2	1	0
Stressing clean plates	4	3	2	1	0
Snacking behaviors	4	3	2	1	0
Rapid rate of eating	4	3	2	1	0
Encourage 2nd helpings	4	3	2	1	0

18. In this question, we are attempting to determine your overall satisfaction with your life. Please circle the number in the column that most accurately describes your reaction to each of the following statements. (Please note: UNKNOWN = UK; NOT APPLICABLE = NA).

	NA	UK	Disagree	Uncertain	Agree
a. All things considered, I believe I have achieved most of my realistic occupational goals.	0	1	2	3	4
b. All things considered, I believe I have achieved most of my realistic educational goals.	0	1	2	3	4
c. All things considered, I believe I have achieved most of my realistic personal goals.	0	1	2	3	4

ID# __ __ __ __ __ __ __ Today's Date __ __-__ __-__ __ Site: __ __

19. In this question, we are attempting to identify the kinds of experiences that assist with adherence to a weight loss program. Please circle the number in the column below that best describes how often you have experienced each of the events described on the left. If the experience described occurred but was not helpful, circle number 1 under "Not at all"; If the experience described did not occur, please circle the 0 under NA which indicates NOT APPLICABLE.

	Often	Sometimes	Rarely	Not at all	NA
a. Compliments from family	4	3	2	1	0
b. Compliments from friends	4	3	2	1	0
c. Encouragement from family	4	3	2	1	0
d. Encouragement from friends	4	3	2	1	0
e. Assistance from family	4	3	2	1	0
f. Support from group leader	4	3	2	1	0
g. Support from group members	4	3	2	1	0
h. Sense of achievement	4	3	2	1	0
i. Decreased physical symptoms	4	3	2	1	0
j. Decreased need for medication	4	3	2	1	0
k. Increased energy level	4	3	2	1	0
l. Increased social life	4	3	2	1	0
m. Increased self confidence	4	3	2	1	0
n. Feeling of well-being	4	3	2	1	0
o. Decreased interest in food	4	3	2	1	0

ID# __ __ __ __ __ __ __ Today's Date __ __-__ __-__ __ Site: __ __

20. In this question, we are attempting to identify the kinds of problems that may interfere with participation in a weight loss program. Please circle the number in the column below that best describes how often you have experienced each of the events described on the left while participating in such a program. If the experience described occurred but was not a problem, circle number 1 under "Not at all". If the experience described did not occur, please circle the O under NA which indicates NOT APPLICABLE.

	Often	Sometimes	Rarely	Not at all	NA
a. Nagging by family	4	3	2	1	0
b. Teasing by friends	4	3	2	1	0
c. Sabotaged by family	4	3	2	1	0
d. Sabotaged by friends	4	3	2	1	0
e. Increased tension at home	4	3	2	1	0
f. Guilt feelings if I cheat	4	3	2	1	0
g. Embarrassed by weight gain	4	3	2	1	0
h. Discouraged by slow loss	4	3	2	1	0
i. Uncomfortable side effects	4	3	2	1	0
j. Financial pressures	4	3	2	1	0
k. Easily fatigued	4	3	2	1	0
l. Less contact with friends	4	3	2	1	0
m. Impaired ability at work	4	3	2	1	0
n. Feeling of hunger	4	3	2	1	0
o. Decreased pleasure	4	3	2	1	0

ID# __ __ __ __ __ __ Today's Date __ __-__ __-__ __ Site: __ __

21. In this question we are attempting to understand your perception of and satisfaction with the level of personal control you have in your life. Please circle the number in the column below that best describes your opinion. (Please note: UNKNOWN = UK; NOT APPLICABLE = NA).

		NA	UK	Agree	Uncertain	Disagree
a.	What happens to me is my own responsibility.	0	1	2	3	4
b.	I don't have enough control over the direction my life is taking.	0	1	2	3	4
c.	When I make plans, I'm almost certain I can make them work.	0	1	2	3	4
d.	Its often pointless to plan ahead because many things are just luck	0	1	2	3	4
e.	There is really no such thing as "luck".	0	1	2	3	4
f.	Most people are unaware of the extent to which lives are controlled by accidental events.	0	1	2	3	4
g.	It is impossible for me to believe that chance or luck is important in my life.	0	1	2	3	4
h.	I often feel I have little influence over the things that happen to me.	0	1	2	3	4
i.	My religious beliefs play an important part in my life.	0	1	2	3	4
j.	My religious beliefs are more important to me today than they were 5 years ago.	0	1	2	3	4
k.	All things considered, I'm satisfied with my life as it is today.	0	1	2	3	4
l.	I'm more satisfied with my life today than I was 5 years ago.	0	1	2	3	4
m.	I anticipate being more satisfied with my life 5 years from now than I am today.	0	1	2	3	4

APPENDIX B
13TH WEEK WEIGHT MANAGEMENT QUESTIONNAIRE

ID# __ __ __ __ __ __ Today's Date __ __-__ __-__ __ Site: __ __

19. Now that you have completed the fasting portion of the program, we are attempting to identify the kinds of experiences that may have assisted with your adherence to the weight loss program. Please circle the number in the column below that best describes how often you have experienced each of the events described on the left. (Please Note: NOT APPLICABLE = NA).

	Often	Sometimes	Rarely	Not at all	NA
a. Compliments from family	4	3	2	1	0
b. Compliments from friends	4	3	2	1	0
c. Encouragement from family	4	3	2	1	0
d. Encouragement from friends	4	3	2	1	0
e. Assistance from family	4	3	2	1	0
f. Support from group leader	4	3	2	1	0
g. Support from group members	4	3	2	1	0
h. Sense of achievement	4	3	2	1	0
i. Decreased physical symptoms	4	3	2	1	0
j. Decreased need for medication	4	3	2	1	0
k. Increased energy level	4	3	2	1	0
l. Increased social life	4	3	2	1	0
m. Increased self confidence	4	3	2	1	0
n. Feeling of well-being	4	3	2	1	0
o. Decreased interest in food	4	3	2	1	0

p. Please list, according to the amount of assistance provided, the factors you found most helpful in adhering to the weight loss program.

1. _____

2. _____

3. _____

q. Did you receive insurance reimbursement? _____(YES) _____(NO)

ID# __ __ __ __ __ __ Today's Date __ __-__ __-__ __ Site: __ __

20. Now that you have completed the fasting portion of the program, we are attempting to identify the kinds of problems that may have interfered with your adherence to the weight loss program. Please circle the number in the column below that best describes how often you have experienced each of the events described on the left. (Please Note: NOT APPLICABLE = NA)

	Often	Sometimes	Rarely	Not at all	NA
a. Nagging by family	4	3	2	1	0
b. Teasing by friends	4	3	2	1	0
c. Sabotaged by family	4	3	2	1	0
d. Sabotaged by friends	4	3	2	1	0
e. Increased tension at home	4	3	2	1	0
f. Guilt feelings if I cheat	4	3	2	1	0
g. Embarrassed by weight gain	4	3	2	1	0
h. Discouraged by slow loss	4	3	2	1	0
i. Uncomfortable side effects	4	3	2	1	0
j. Financial pressures	4	3	2	1	0
k. Easily fatigued	4	3	2	1	0
l. Less contact with friends	4	3	2	1	0
m. Impaired ability at work	4	3	2	1	0
n. Feeling of hunger	4	3	2	1	0
o. Decreased pleasure	4	3	2	1	0

p. Please list, according to the degree of difficulty, the factors you found most difficult in adhering to the weight loss program.

1. _____

2. _____

3. _____

ID# __ __ __ __ __ __ __ Today's Date __ __-__ __-__ __ Site: __ __

21. In repeating this question to you, we are attempting to determine if your perception of and satisfaction with the level of personal control you have in your life has been altered during the reduction in your weight. Please circle the number in the column below that best describes your opinion at this time. (Please note: UNKNOWN = UK; NOT APPLICABLE = NA).

		NA	UK	Agree	Uncertain	Disagree
a.	What happens to me is my own responsibility.	0	1	2	3	4
b.	I don't have enough control over the direction my life is taking.	0	1	2	3	4
c.	When I make plans, I'm almost certain I can make them work.	0	1	2	3	4
d.	Its often pointless to plan ahead because many things are just luck	0	1	2	3	4
e.	There is really no such thing as "luck".	0	1	2	3	4
f.	Most people are unaware of the extent to which lives are controlled by accidental events.	0	1	2	3	4
g.	It is impossible for me to believe that chance or luck is important in my life.	0	1	2	3	4
h.	I often feel I have little influence over the things that happen to me.	0	1	2	3	4
i.	My religious beliefs play an important part in my life.	0	1	2	3	4
j.	My religious beliefs are more important to me today than they were 5 years ago.	0	1	2	3	4
k.	All things considered, I'm satisfied with my life as it is today.	0	1	2	3	4
l.	I'm more satisfied with my life today than I was 5 years ago.	0	1	2	3	4
m.	I anticipate being more satisfied with my life 5 years from now than I am today.	0	1	2	3	4

APPENDIX C
25th WEEK WEIGHT MANAGEMENT QUESTIONNAIRE

ID# __ __ __ __ __ __ Today's Date __ __-__ __-__ __ Site: __ __

19. Now that you have completed the refeeding and stabilization portions of the program, we are attempting to identify the kinds of experiences that may have assisted with your adherence to those segments of the program. Please circle the number in the column below that best describes how often you have experienced each of the events described on the left after completing the fasting phase of the program. (Please Note: NOT APPLICABLE = NA).

	Often	Sometimes	Rarely	Not at all	NA
a. Compliments from family	4	3	2	1	0
b. Compliments from friends	4	3	2	1	0
c. Encouragement from family	4	3	2	1	0
d. Encouragement from friends	4	3	2	1	0
e. Assistance from family	4	3	2	1	0
f. Support from group leader	4	3	2	1	0
g. Support from group members	4	3	2	1	0
h. Sense of achievement	4	3	2	1	0
i. Decreased physical symptoms	4	3	2	1	0
j. Decreased need for medication	4	3	2	1	0
k. Increased energy level	4	3	2	1	0
l. Increased social life	4	3	2	1	0
m. Increased self confidence	4	3	2	1	0
n. Feeling of well-being	4	3	2	1	0
o. Decreased interest in food	4	3	2	1	0

p. Please list, according to the amount of assistance provided, the factors you found most helpful in adhering to the weight loss program.

1. _____

2. _____

3. _____

q. Did you receive insurance reimbursement? _____(YES) _____(NO)

ID# __ __ __ __ __ __ __ Today's Date __ __-__ __-__ __ Site: __ __

20. Now that you have completed the refeeding and stabilization portions of the program, we are attempting to identify the kinds of problems that may have interfered with your adherence to those segments of the program. Please circle the number in the column below that best describes how often you have experienced each of the events described on the left. (Please Note: NOT APPLICABLE = NA)

	Often	Sometimes	Rarely	Not at all	NA
a. Nagging by family	4	3	2	1	0
b. Teasing by friends	4	3	2	1	0
c. Sabotaged by family	4	3	2	1	0
d. Sabotaged by friends	4	3	2	1	0
e. Increased tension at home	4	3	2	1	0
f. Guilt feelings if I cheat	4	3	2	1	0
g. Embarrassed by weight gain	4	3	2	1	0
h. Discouraged by slow loss	4	3	2	1	0
i. Uncomfortable side effects	4	3	2	1	0
j. Financial pressures	4	3	2	1	0
k. Easily fatigued	4	3	2	1	0
l. Less contact with friends	4	3	2	1	0
m. Impaired ability at work	4	3	2	1	0
n. Feeling of hunger	4	3	2	1	0
o. Decreased pleasure	4	3	2	1	0

p. Please list, according to the degree of difficulty, the factors you found most difficult in adhering to the weight loss program.

1. _____

2. _____

3. _____

ID# __ __ __ __ __ __ __ Today's Date __ __-__ __-__ __ Site: __ __

21. In repeating this question to you, we are attempting to determine if your perception of and satisfaction with the level of personal control you have in your life has been altered during the reduction in your weight. Please circle the number in the column below that best describes your opinion at this time. (Please note: UNKNOWN = UK; NOT APPLICABLE = NA).

		NA	UK	Agree	Uncertain	Disagree
a.	What happens to me is my own responsibility.	0	1	2	3	4
b.	I don't have enough control over the direction my life is taking.	0	1	2	3	4
c.	When I make plans, I'm almost certain I can make them work.	0	1	2	3	4
d.	Its often pointless to plan ahead because many things are just luck	0	1	2	3	4
e.	There is really no such thing as "luck".	0	1	2	3	4
f.	Most people are unaware of the extent to which lives are controlled by accidental events.	0	1	2	3	4
g.	It is impossible for me to believe that chance or luck is important in my life.	0	1	2	3	4
h.	I often feel I have little influence over the things that happen to me.	0	1	2	3	4
i.	My religious beliefs play an important part in my life.	0	1	2	3	4
j.	My religious beliefs are more important to me today than they were 5 years ago.	0	1	2	3	4
k.	All things considered, I'm satisfied with my life as it is today.	0	1	2	3	4
l.	I'm more satisfied with my life today than I was 5 years ago.	0	1	2	3	4
m.	I anticipate being more satisfied with my life 5 years from now than I am today.	0	1	2	3	4

APPENDIX D
EVALUATION OF CONTENT VALIDITY FORM

A Study of the Environmental and Behavioral Factors
Influencing Weight Management
Among Medically at Risk Obese Adults

An Evaluation of Content Validity

The following questions will be presented to patients who are a minimum of fifty pounds or thirty percent over ideal body weight who are entering a protein sparing modified fasting program which incorporates a behavioral modification component. They will also be presented to a control group composed of persons representative of the population in general.

Please indicate your evaluation of the appropriateness for inclusion of the following points by ranking each item in the blank provided. Please score using one (1) for highly relevant, two (2) for relevant, or three (3) for inappropriate.

I. Obesity among family members

a. Spouse ..... _____

b. Children ..... _____

c. Parents ..... _____

d. Siblings ..... _____

e. Grandparents ..... _____

II. Obesity among acquaintance

a. Friends ..... _____

b. Coworkers ..... _____

c. Persons who are admired ..... _____

III. Attitude of family toward obesity

a. Spouse ..... _____

b. Children ..... _____

c. Parents ..... _____

d. Siblings ..... _____

e. Grandparents ..... _____

IV. Attitude of acquaintances toward obesity

a. Friends ..... _____

b. Coworkers ..... _____

c. Females in general ..... _____

d. Males in general ..... _____

V. Attitude of family toward very low calorie diets (less than 500 calories)

a. Spouse ..... _____

b. Children ..... _____

c. Parents ..... _____

d. Siblings ..... _____

e. Grandparents ..... _____

VI. Attitude of acquaintances toward very low calorie diets (under 500 calories)

a. Friends ..... _____

b. Coworkers ..... _____

c. Females in general ..... _____

d. Males in general ..... _____

VII. Similarity of the individual's attitudes and behaviors relating to food and eating to those of the childhood home

a. Methods of cooking ..... _____

b. Emphasis of cooking skills ..... _____

c. Eating as a social event ..... _____

d. Food withheld as punishment ..... _____

e. Food preferences ..... _____

f. Food as a reward ..... _____

g. Stressing clean plates ..... _____

h. Snacking behaviors ..... _____

i. Rapid rate of eating ..... _____

j. Encourage second helpings ..... _____

VIII. Overall level of life satisfaction

a. Achievement of occupational goals ..... _____

b. Achievement of educational goals ..... _____

c. Achievement of personal goals ..... _____

IX. Experiences that assist with adherence to a weight loss program

a. Compliments from family ..... _____
b. Compliments from friends ..... _____
c. Encouragement from family ..... _____
d. Encouragement from friends ..... _____
e. Assistance from family ..... _____
f. Support from group leader ..... _____
g. Support from group members ..... _____
h. Sense of achievement ..... _____
i. Decreased physical symptoms ..... _____
j. Decreased need for medication ..... _____
k. Increased energy level ..... _____
l. Increased social life ..... _____
m. Increased self-confidence ..... _____
n. Feeling of well being ..... _____
o. Decreased interest in food ..... _____

X. Problems that interfere with adherence to a weight loss program

a. Nagging by family ..... _____
b. Teasing by friends ..... _____
c. Sabotaged by family ..... _____
d. Sabotaged by friends ..... _____
e. Increased tension at home ..... _____
f. Guilt feelings if cheats ..... _____
g. Embarrassed by weight gain ..... _____
h. Discouraged by slow loss ..... _____
i. Uncomfortable side effects ..... _____
j. Financial pressures ..... _____
k. Easily fatigued ..... _____
l. Less contact with friends ..... _____
m. Impaired ability at work ..... _____
n. Feelings of hunger ..... _____
o. Decreased pleasure ..... _____

XI. Perceived locus of control (internal vs. external)

a. Responsible for own actions ..... _____

b. Control over direction of life ..... _____

c. Self-confidence ..... _____

d. Perceives self as victim of luck ..... _____

e. Controlled by external circumstances ..... _____

f. Attitude toward influence of luck ..... _____

g. Relevance of religious beliefs ..... _____

XII. Level of life satisfaction (comparative over time)

a. Current ..... _____

b. Five years ago ..... _____

c. Five years from now ..... _____

APPENDIX E
INFORMED CONSENT FORMS

INFORMED CONSENT TO PARTICIPATE IN NURSING RESEARCH PROJECT: Form A

SOCIAL LEARNING FACTORS AND THEIR RELATIONSHIP TO THE EFFECTIVENESS OF BEHAVIOR MODIFICATION IN THE TREATMENT OF OBESITY

Investigator: Frances B. Jacobs, R.N., Doctoral Candidate
University of Florida College of Nursing
Phone: (904) 752-8884 (home) or 752-1355 (work)

You are invited to participate in a research project. This consent form is designed to provide you with information about this nursing research study and to answer any questions you may have.

The purpose of this research is to 1.) explore and describe social learning factors which influence an individual's attitudes and behaviors related to food and eating and 2.) explore and describe environmental and behavioral factors which may contribute to or interfere with weight reduction and the maintenance of weight loss.

If you agree to participate, you will be asked to complete a questionnaire at weeks 1, 13, and 25 during your participation in the 26 week weight loss program. I am requesting access to your records at weeks 13 and 25 to determine weekly weight loss plus total weight loss achieved while participating in the program. If you leave the program prior to either week 13 or 25, the follow up information will be gathered by phone or mailed questionnaire.

No actual risks for study participants have been identified or are anticipated. Benefits to the subjects may include the opportunity to reflect upon specific personal elements of obesity and weight loss. Upon request, you will be given an abstract describing the research findings.

Taking part in the study is strictly voluntary. Should you decide not to do so, it will in no way interfere with participation in the weight loss program or the quality of services provided

There will be no monetary compensation for participation in this study.

Because the plan of the study includes completion of questionnaires at weeks 1, 13, and 25, anonymity is not possible but patient identification numbers instead of names will be used on the form. Only the researcher and her supervisory committee will have access to the date. Confidentiality will be provided in that no reports of the study will identify individual participants in any way. The results of the study will be published.

CONSENT TO PARTICIPATE

I have read the above information and I am willing to participate in the project described. I understand that this includes the completion of three questionnaires (weeks 1, 13, and 25 of the program) and permission for the investigator to have access to my chart at the time of the second and third surveys. If I have left the program prior to either of those times, I give permission to the investigator to contact me by mail or by phone for the purpose of follow up interview. I understand that I will not receive any monetary compensation for participation in the study. I am free to withdraw from the study at any time.

Signature: _____ Date:_____

Witness: _____ Date:_____

INFORMED CONSENT TO PARTICIPATE IN NURSING RESEARCH PROJECT: Form B

SOCIAL LEARNING FACTORS AND THEIR RELATIONSHIP TO THE EFFECTIVENESS OF BEHAVIOR MODIFICATION IN THE TREATMENT OF OBESITY

Investigator: Frances B. Jacobs, R.N., Doctoral Candidate
University of Florida College of Nursing
Phone: (904) 752-8884 (home) or 752-1355 (office)

You are invited to participate in a research project. This consent form is designed to provide you with information about this nursing research study and to answer any questions you may have.

The purpose of this research is to 1.) explore and describe social learning factors which influence an individual's attitudes and behaviors related to food and eating and 2.) explore and describe environmental and behavioral factors which may contribute to or interfere with weight reduction and the maintenance of weight loss.

If you are willing to participate, you are requested to complete the attached questionnaire. The data collected from this group will be compared with similar data obtained from participants in an organized weight loss program.

No actual risks for study participants have been identified or are anticipated. Benefits to the subjects may include the opportunity to reflect upon specific personal elements of obesity and weight loss. Upon request, you will be given an abstract describing the research findings.

Taking part in the study is strictly voluntary. There will be no monetary compensation for participation in this study.

In order to assure anonymity, identification numbers instead of names will be used on the form. Only the researcher and her supervisory committee will have access to the data. Confidentiality will be provided in that no reports of the study will identify individual participants in any way. The results of the study will be published.

CONSENT TO PARTICIPATE

I have read the above information and I am willing to participate in the project described. I understand that I will not receive any monetary compensation for participation in the study.

Signature: _____ Date:_____

Witness: _____ Date:_____

INFORMED CONSENT TO PARTICIPATE IN NURSING RESEARCH PROJECT

A Study of the Environmental and Behavioral Factors
Influencing Weight Management
Among Medically at Risk Obese Adults

Investigator: Frances B. Jacobs, R.N., Doctoral Candidate
University of Florida College of Nursing
Phone: (904) 752-8884 (home) or 752-1355 (work)

At the first meeting of your Optifast Program, you agreed to participate in a research project. As was explained in the cover letter of the questionnaire you completed, follow up surveys are being conducted at weeks 13 and 25 of the 26 week program. When you signed the original consent to participate, you gave us permission to contact you at those times as well as to conduct chart reviews to determine average weekly weight loss plus total weight loss achieved while participating in the program. It was noted at that time that in the case of a participant who has dropped out of the program prior to either of the two follow up visits, the follow up information would be gathered by phone or mailed questionnaire.

Taking part in the study is strictly voluntary and there will be no monetary compensation for participating in the study.

The results of the study will be initially published in dissertation format and may be disseminated among professional groups. Further publication in research or professional journals will follow. A summary of findings will be available to participants upon request.

CONSENT TO PARTICIPATE

I have read the above information and I am willing to continue participation in the project. I understand that this includes the completion of two follow up questionnaires (weeks 13 and 25 of the program) and permission for the investigator to have access to my chart at the time of the second and third surveys. If I have left the program prior to either of those times, I give permission to the investigator to contact me by mail or by phone for the purpose of follow up interview. I understand that I will not receive any monetary compensation for participation in the study. I am free to withdraw from the study at any time.

Signature: _____ Date:_____

Witness: _____ Date:_____

BIOGRAPHICAL SKETCH

Frances Bell Jacobs was born in Kansas and reared in rural southeastern Nebraska. After attending parochial grade and high school, she entered St. Mary College and the Providence Hospital School of Nursing, Kansas City, in 1953. She later transferred to the Sisters of Charity School of Nursing, Billings, Montana, where she received a diploma in 1958.

Attending college classes part time while she was employed as a nurse, Ms. Jacobs earned a Bachelor of Science degree in 1965 with a major in nursing education. In 1968, as a member of a U.S. Catholic Conference Health Care Advisory Team, Ms. Jacobs spent a year in a South Vietnamese civilian hospital.

Upon returning from South Vietnam, Ms. Jacobs entered graduate school at the University of North Carolina, Chapel Hill, where she earned a Master of Science degree in nursing in 1971. While in graduate school, Ms. Jacobs married and gave birth to a son. A year following graduation, Ms. Jacobs and her family moved to Lake City, Florida, where she has continued to reside since that time.

After teaching for two years in the nursing department at the Lake City Community College, 1972-74, Ms. Jacobs joined the staff of the North Central Florida Community Mental Health Center. She remained on staff there as an outpatient counselor for 11 years. Throughout these years, she was an active provider of continuing education for nurses in north Florida.

In 1985, Ms. Jacobs became coordinator of continuing education at Lake Shore Hospital in Lake City. She continued as an instructor in that department after she began doctoral studies at the University of Florida College of Nursing in 1986.

Ms. Jacobs joined the staff of the Lake City Medical Center Optifast Program in 1987 as a behaviorist. In 1988 she was named director of that program. She continues to provide continuing education for nurses in north Florida and Georgia.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Faye Gary-Harris

Faye Gary-Harris, Chairman
Professor of Nursing

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Sally Hutchinson

Sally Hutchinson
Associate Professor of Nursing

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Ronald L. Akers

Ronald Akers
Professor of Sociology

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Ronald G. Marks

Ronald G. Marks
Associate Professor of Statistics

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Gustave Newman
Associate Professor of Psychiatry

This dissertation was submitted to the Graduate Faculty of the College of Nursing and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Dean, College of Nursing

Dean, Graduate School

December, 1989

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